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This study, undertaken in the fall of 1965, had four basic objectives: (1) to determine the feasibility of centralizing the cataloging operation of the 3 library systems, (2) to determine the desirability of inter-system centralization of book preparation and acquisition, (3) to propose the operating procedures and mechanisms integral to any scheme for increased centralization appearing feasible and desirable, including computer-system design and data processing equipment if appropriate, and (4) to suggest where and how the recommended centralized facility should be organized. Major recommendations include a single cataloging and acquisition center for the 3 libraries, extensive use of computers for catalog production, output in the form of a tri-system "constant volume book catalog", and delay of consideration of whether to include other libraries in the system until the processing network is well established. (CC)

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THE FEASIBILITY OF FURTHER CENTRALIZING THE TECHNICAL PROCESSING OPERATIONS OF THE PUBLIC LIBRARIES OF NEW YORK CITY

NELSON ASSOCIATES, INCORPORATED

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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THE FEASIBILITY OF FURTHER CENTRALIZING THE TECHNICAL PROCESSING OPERATIONS OF THE PUBLIC LIBRARIES OF NEW YORK CITY

A Survey Conducted for the Brooklyn Public Library, The New York Public Library and the Queens Borough Public Library

Nelson Associates, Incorporated
March 1966

in collaboration with

The Theodore Stein Company

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March 15, 1966

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Mr. Edward G. Freehafer
Director
The New York Public Library
New York, New York

Mr. Harold W. Tucker
Chief Librarian
Queens Borough Public Library
Jamaica, New York

Gentlemen:

We are pleased to submit herewith our report on the technical processing activities of the public library systems in New York City, and our recommendations for further centralization of the processing operations of these libraries.

The interest and cooperation we have encountered throughout the course of our investigation attests to the prevailing spirit of innovation that has led you and your staffs to seek new avenues for more effective and efficient public service. We hope that our final report will provide the basis for yet another step in that direction and we stand ready to assist in any way you may think appropriate the implementation of all or parts of the recommendations made in this report.

Yours very truly,

NELSON ASSOCIATES, INCORPORATED

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TABLE OF CONTENTS

Page

Letter of Transmittal

SUMMARY i

Recommendations and Conclusions i

Major Findings ii

Chapter I INTRODUCTION 1

Procedure, Definitions and Criteria 3

Chapter II A CENTRALIZED TECHNICAL PROCESSING NETWORK FOR THE PUBLIC LIBRARIES OF NEW YORK CITY 7

Cataloging and Catalog Production and Maintenance 7
- Cataloging 7
- Catalog Production and Maintenance 10
- Description of Tri-System Union Book Catalog 15
- Other Outputs of Proposed Cataloging Center 19
- Historical Catalog Conversion 20

Acquisitions 22

Preparation and Delivery 24

Chapter III SUGGESTED OPERATING PROCEDURES 27

Acquisition 27
- Library of Congress Copy 27
- Books Received Automatically 28
- Special Orders 29
- Supplier Assignment 29
- Serial Subscription Renewal 29

Preparation and Delivery 30
- Serials Check-In 31

Cataloging 31
- New and Duplicate Title Searching 31
- Catalog Work Sheets 33
- Proofreading 33

		Page
	Administrative Outputs	33
	Accounting	34
	Functions Carried Out By Professional and Clerical Staff	35
	Network Structure and Work Flow	37
Chapter IV	COST AND SAVINGS OF RECOMMENDED NETWORK	39
Chapter V	IMPLEMENTATION	42
	Tri-System Card Catalog, Installation, Computer-System Design and Programming Time and Costs	42
	Guidelines	43

APPENDIXES

Appendix A	TECHNICAL PROCESSING OPERATIONS IN THE PUBLIC LIBRARIES OF NEW YORK CITY	1
	Volume of Technical Processing Operations	3
	Cost of Technical Processing Operations	9
	Future Volume of Technical Processing Operations	14
	Cataloging Practices	14
Appendix B	Part I. CATALOGING OVERLAP	1
	Part II. SAMPLING PROCEDURE	3
	Part III. SAMPLING RESULTS	7
Appendix C	PROJECTED COSTS OF THE RECOMMENDED PLAN	1
	Operating Costs	1
	Acquisitions	1
	Cataloging	2
	Preparation	3
	Delivery	4

Page

Catalog Production and Maintenance 5
Comparative Overall Costs 5
Capital Investment 7
Tri-System Union Card Catalog Costs 7
System Design Costs 8
Equipment Installation Costs 10

Appendix D HISTORICAL CARD CATALOG CONVERSION 1

Independent Conversion of Systems' Catalogs 1
Combined Conversion of Systems' Card Catalogs 2

Appendix E Part I. COMPUTER-SYSTEM FLOW CHART 1

Input, Transcribe and Sort 1
Input to Sort Run-2 1
Update, Output and Sort 3
Catalog 4
Process and List 5

Part II. EQUIPMENT SPECIFICATIONS AND ALTERNATIVES 10

Equipment Specifications 10
Input-Device Alternatives 11
Use of Random Access Computer Storage 11

Appendix F Part I. BOOK CATALOGS 1

Cost of Book Catalog Production 1
City-Wide Book Catalog Variations 3
Book Catalog Design and Organization 3
Interval Between Catalog Supplements 4
Form of the Supplement 4
Page Density of Entries in the Book Catalog 5
Size of the Main Catalog 6
Methods of Grouping Libraries in a Union Catalog 7

Page

Part II. BOOK CATALOG COST CALCULATIONS 9

Optimum Recumulation Intervals 9
Explanation of Printing Cost Tables for
  Constant Volume Catalogs 10
    Item Multiplication Factor 10
    Cost Per Page 10
    Pages Per Year 11
    Yearly Catalog Cost 11

LIST OF TABLES

			Page
Chapter II	Figure 1.	Tri-System Catalog Components	18
Chapter III	Diagram	Network Structure and Work Flow	38
Chapter IV	Table 1.	Elements of Recommended Processing Network and Catalog Output Based on 1,000,000 Items	40
Appendix A	Table A-1.	Book and Phonorecord Holdings of Three New York City Library Systems	1
	Table A-2.	General Characteristics of Centralized Processing Operations —Public Library Systems, New York City	2
	Table A-3.	Technical Processing Work Load —Public Library Systems, New York City, 1960-61—1964-65	4
	Table A-4.	Technical Processing Work Load —Public Library Systems, New York City, 1964-65	6
	Table A-5.	Titles Cataloged—Work Load By Month, 1964-65	10
	Table A-6.	Total Cost of Technical Processing Operations —Public Library Systems, New York City, 1964-65	13
	Table A-7.	Processing Costs Per Item —New York City Public Library Systems, 1964-65	15
	Table A-8.	Characteristics of Cataloging Practices—Public Library Systems, New York City, July 1965	16

			Page
Appendix B	Figure B-1.	Three Systems' Cataloging Overlap	4
	Table B-1.	Sampling to Determine New York City Systems' Cataloging Overlap	7
Appendix C	Table C-1.	Estimate for Recommended Acquisition Element	2
	Table C-2.	Estimate for Recommended Cataloging Element	3
	Table C-3.	Estimate for Recommended Preparation Element	4
	Table C-4.	Estimate for Recommended Delivery Element	4
	Table C-5.	Estimate for Recommended Catalog Production and Maintenance Element	5
	Table C-6.	Costs: Present Arrangements and Recommded Plan	6
	Table C-7.	Estimated Capital Costs of Proposed Network	7
	Table C-8.	Tri-System Union Card Catalog Costs	8
	Table C-9.	Four-Year System Design and Programming Costs	9
	Table C-10.	Electronic Data Equipment Installation Costs	10
Appendix E	Chart E-1.	Input Transcription, Item Master File Maintenance, Cataloging	8
	Chart E-2.	Ordering, Accounting, Processing Material	9

			Page
Appendix F	Table F-1.	Estimate of Alternative Book Catalog Costs	2
	Table F-2.	Cost Modifications for City-Wide Book Catalog Variations	3
	Tables F-3a. F-3b. F-3c.	Basic Printing Cost Tables —Constant Volume Catalogs	12
	F-3d.	Pages Per Year for Each Item Added (F/D)	13
	Table F-4.	Yearly Catalog Cost in Thousands of Dollars	14

SUMMARY

The following pages contain in brief compass the major recommendations and conclusions of the survey as well as the most important findings. Substantiation of these summary statements is to be found in the appropriate portions of the text and the appendixes.

RECOMMENDATIONS AND CONCLUSIONS

The central recommendations for further centralization of the technical processing operations in the public libraries of New York City are summarized below.

1. A single cataloging center is proposed to meet the needs of the three public libraries of New York City.
2. A single acquisitions center, sharing the facilities of the cataloging center and extensively employing the center's EDP equipment, is proposed to meet the needs of these libraries.
3. It is recommended that the three existing preparation departments not be further centralized until the cataloging-acquisition center is fully operational.
4. Computers should be used extensively in acquisition, for catalog production and for producing certain materials for physical preparation.
5. A tri-system "constant volume book catalog," marked to show the holdings of the three libraries, is the proposed form of output of the single cataloging center.
6. The proposed processing network can be expected to produce savings annually of approximately $425,000 on a city-wide basis.
7. A period of about three years will be required for necessary system design and programming. It is

estimated that an additional period of one year will be required for testing and phased implementation before a smoothly operating processing network can be achieved.

8. Capital investment expenditures associated with the establishment of the proposed network are estimated at $850,000.

9. Only after the processing network is operating smoothly should consideration be given to accepting the added volume and other complications implicit in serving other constituencies such as school and college libraries.

10. If a consensus exists that the recommended program should be pursued then it becomes urgent that consideration be given to those issues which must be settled before firm action can be taken. These issues include organization structure, location, financing, and catalog conversion.

11. The proposals contained in this report should not be construed as a recommendation that the three libraries of New York City exclude themselves from plans for further centralization of processing among the 22 public library systems of New York State.

MAJOR FINDINGS

1. Altogether in 1964-65 the three libraries cataloged 63,307 titles of materials new to the individual systems. It is estimated that of these 63,307 only some 40,000 represented unique titles.

2. The three libraries spent an estimated $1,700,000 on technical processing and an additional $250,000 on card catalog filing in 1964-65. The average processing cost per item prepared for these libraries was $1.69.

3. Differences in cataloging methods among the libraries are not of themselves great enough to preclude a single cataloging center serving all three.

Chapter I

INTRODUCTION

This report contains the results of a study of the feasibility of further centralizing the technical processing operations of the three public library systems in New York City— the Brooklyn Public Library, The New York Public Library and the Queens Borough Public Library— undertaken in the Fall of 1965.

Four basic objectives were established for the study.

1. To determine the feasibility of centralizing the cataloging operations of the three library systems;
2. To assess the desirability of inter-system centralization of book preparation and acquisition;
3. To propose the operating procedures and mechanisms integral to any scheme for increased centralization that appears feasible and desirable, including basic computer-system design and suggested data processing equipment characteristics if advantageous uses of such equipment for technical processing activities are brought to light in the study; and
4. To suggest where and how any recommended centralized facility should be organized, provide guidelines for the contractual arrangements that should be developed among the three libraries to support such a facility and prepare an approximate timetable for executing the recommendations.

The scope of the study does not include the Reference Department of The New York Public Library.

The present report began with a summary of the recommendations, conclusions and findings of the study. The body of the report discusses and explains these outcomes in the light of the research conducted. The appendixes present the methodology of various analyses and the details of data obtained in connection with the study and also provide certain technical information on the recommended processing network.

This survey was conducted simultaneously with a study of the feasibility of centralized processing for the state's public libraries, undertaken for the New York State Library.[1] Inasmuch as the three public libraries in New York City are unique in many dimensions impinging on the functions of technical processing— size of collections, rate of acquisitions, extent and nature of current centralized processing, population served and geographic proximity— it was deemed necessary that a detailed analysis be made of the factors promoting and hindering further centralization of technical processing operations in these libraries. The companion report referred to above contains general recommendations as to how the three New York City systems might fit into a proposed statewide plan of centralized processing for all the state's public library systems.

Working closely with the staff of Nelson Associates on this survey were: The Theodore Stein Company, which provided expert counsel on the data processing aspects of the study; Dr. Maurice Tauber, Melvil Dewey Professor of Library Science, School of Library Service, Columbia University; Dr. Richard P. Brief, Assistant Professor of Business Statistics, New York University; and Dr. Seoud Matta, a professional librarian who assisted particularly on questions relating to cataloging practices. Grateful acknowledgment is made of the untiring cooperation and assistance of the technical processing staffs of the three public libraries, of the interest and invaluable advice of numerous public service personnel in each system and of the help and direction provided at one time or another in the course of the study by virtually all of the administrative units of the library systems in New York City. Special thanks are due to the many individuals, enterprises, institutions and organizations within and beyond New York City that provided assistance on some of the fundamental library and data processing aspects of this study.

This report consists of five chapters and six supporting appendixes. The remaining portion of this chapter provides a description of certain crucial procedures, definitions and criteria that have guided the conduct of the study. In Chapter II the recommended program is presented in terms of the basic components and end-products of the processing cycle—cataloging and catalog production and maintenance; acquisition; and, preparation and delivery. The suggested operating procedures of the proposed technical processing network are described in Chapter III, which concludes with a diagram of the recommended city-wide processing network and work flow. Chapter IV summarizes the operating costs and savings associated with this processing network. Finally, Chapter V discusses questions of implementation. The appendixes provide more detailed information on a number of subjects dealt with in summary fashion in the body of the report.

---

[1] Centralized Processing for the Public Libraries of New York State, Nelson Associates, Inc., for the New York State Library, 1966.

PROCEDURE, DEFINITIONS AND CRITERIA

In a study of this complexity it was essential to subdivide the work into a number of distinct tasks. These elements of the work program then provided essential facts or conclusions on which other aspects of the study impinged. The most important of these distinct survey tasks included:

- analysis of the steps in technical processing into major elements, and defining these elements;
- establishment of criteria for comparing alternative processing possibilities;
- review and analysis of available papers and studies relating to the concept of centralization of cataloging;
- obtaining detailed information on the present processing procedures of the three library systems;
- defining the cost factors to be included in the construction of the total cost of technical processing activities;
- determining the total current cost and volume of processing operations in the three systems;

- devising and applying a sampling technique to determine the extent of duplication of cataloging efforts in these libraries;

- examination of the extent and characteristics of variations in catalog entry practices and classifications among the three systems;

- estimating total future volume of processing in the systems; and,

- estimating potential demand from schools and colleges in New York City for processing services contracted from a centralized public library facility.

Definitions of the major components of the processing cycle are, of course, essential to the collection of meaningful data and to the comparison of alternative solutions. The processing activities studied include those in the processing cycle starting with either the receipt of library materials sent "automatically" by publishers or the receipt of an order form from a branch or central agency through the cycle to the time the materials are delivered to the branch or central agency ready for shelving. Activities of offices of adult, young adult or juvenile services, and other public service personnel directed to the determination of what materials should and should not be recommended for purchase are not included in the scope of processing activities studied. Efforts of central division and agency personnel in behalf of the maintenance of card catalogs and shelf lists are included. For the purposes of analysis, processing activities are divided into five components and distinguished as follows:

> Acquisition: includes ordering, order searching, maintenance of acquisition files, initial and follow-up communication with vendors, checking in of materials received, any billing involved, branch encumbering, and any necessary record keeping; and also includes physical production of ordering lists, review clipping, and assignment of books to system staff for review.
>
> Cataloging and Catalog Production: includes "new" and "added copy" title searching, descriptive cataloging, subject heading and classification, the maintenance of catalogs and files necessary for the operation of

centralized processing, production of catalog cards and book cards, and any other record keeping necessary for the above activities.

Preparation: includes production of book and record pockets, assembling of pockets, book cards and catalog card sets, pasting in of book pockets, jacketing, property stamping, reinforcing of paperbacks or other new material and any record keeping necessary for the above activities.

Delivery: includes readying of materials for shipping, delivery to branches or agencies, and any necessary record keeping.

Catalog Maintenance: includes additions to, withdrawals from, and editing of all card catalogs and shelf lists that are not maintained by the central cataloging department staff.

It should be noted that binding and mending are not included in the scope of the analysis.

While the chronological order of the processing cycle can be viewed as given above, the logical order for purposes of analysis appears to be cataloging and catalog production and maintenance, acquisition, and preparation and delivery. The latter is the order in which they are treated in Chapter II of the report.

Three criteria have been applied throughout in the comparison of alternative processing schemes and catalog solutions— speed, cost and quality. Each factor is sufficiently important that no proposal can be entertained which is markedly deficient on any one count. As the alternatives are discussed later, some are discarded because they would be too slow or offer risks of being so, others because they are too costly and still others because of the inferiority of the catalog product. Considerations of quality are complex; they include such diverse questions as: Will further centralized cataloging destroy the integrity of established subject collections? Will the catalog produced be a better tool for the patron? What additional burdens to library staffs will result from fundamental changes in processing procedures or catalog format? With respect to costs, the chief issues are whether services comparable to those now provided can be obtained more economically by further centralization, and whether there are improvements in service obtainable without cost increases. Speed is critical at every stage in the process since the total time elapsing from ordering to delivery is what matters and bottlenecks in cataloging or preparation are just as unacceptable as delays in order processing or delivery.

Chapter II

A CENTRALIZED TECHNICAL PROCESSING NETWORK FOR THE PUBLIC LIBRARIES OF NEW YORK CITY

A technical processing network designed to constitute the basis for further centralization of these operations in the three public library systems of New York City is described in detail in this chapter.

CATALOGING AND CATALOG PRODUCTION AND MAINTENANCE

Cataloging

A single cataloging center is recommended to meet the needs of the public libraries of New York City.

The desirability of any further centralization of cataloging depends upon three basic considerations: the amount of duplication of effort in cataloging now occurring; the question of the economic size of a cataloging center; and the extent and seriousness of differences in cataloging practices.

Duplication of Cataloging Effort. In 1964-65, the public libraries of New York City cataloging a total of about 63, 300 titles. A matching of sample titles indicates that only about 43, 300 of these titles were different titles, and that of these different titles, only about 38, 100 were titles that had never before been cataloged by any of the public libraries in New York City (see Appendix B). Thus it appears that about 40% more cataloging is being done in the three libraries than would need to be done at an ongoing city-wide cataloging center.

Economic Size. It is estimated that current system cataloging efforts in New York City cost about $820, 000 annually. Largely because of the elimination of duplicate professional and clerical effort and the computerization of many manual searching procedures, the proposed single center would spend an estimated $350, 000 a year on cataloging (see Appendix C).

Furthermore, there does not appear to be any inherent reason to believe that a center cataloging 40,000 titles would need to be larger than the optimum economic size. Even assuming that there is no increase in the availability of Library of Congress copy, whether on magnetic tape or in proof sheet form, the center would not need to employ more than 10 to 12 catalogers. If, on the other hand, the percentage of titles that are cataloged in the city-wide center from available LC copy is substantially greater than the current proportion at the three public library systems, fewer catalogers would be required to handle the center's cataloging work load.

Nevertheless, each of the three systems faces serious "bottleneck" problems in their cataloging departments which often result in backlogs amounting to several thousand titles, almost always in specialized English and foreign material. The tendency for such backlogs to develop at a city-wide center will be even greater than at any one of the systems, since the center will be collecting, in the course of eliminating duplication, all the highly specialized material now cataloged at each library under a single central cataloging staff. The higher the level of cataloging centralization, therefore, the more imperative it becomes that the cataloging center has the resources to avoid production bottlenecks. The solution, of course, is easier to enunciate than to achieve: efficient administration and more than enough personnel to do the work. Since the amount of the savings to be realized is substantial, it would be possible to increase the personnel budget of the cataloging center if necessary, while still reaping great benefits. The budget figure mentioned above is premised on an average annual work load of 3,650 titles per cataloger. (This work load includes an annual average of 1,640 titles requiring "original" cataloging and an average of 2,010 titles for which LC cataloging copy is available, in accordance with the finding that the systems currently have LC copy on hand for about 55% of their titles cataloged.) If this work load were to be reduced by 20% to prevent possible backlogs, the increased cost of additional catalogers would be about $35,000 (including fringe benefits and additional overhead expenses).

In short, duplication and reduplication of cataloging effort exists to such a degree at present that savings from centralization amply justify a well staffed center capable of producing the highest quality of professional work in timely fashion.

Differences in Cataloging Practices. The potential impediments to further centralization of cataloging due to variations among the three libraries in their catalog entry and classification practices are more related to historical differences than to current practices, per se. The major issues surrounding centralized cataloging for systems with historical differences in cataloging practices relate to (1) the dislocation on library shelves resulting from changes in classification practices, and (2) the dislocations in card catalogs resulting from changes in rules of entry.

Dislocations on library shelves are of concern because of the "open shelf" policy of the public libraries. It is argued that a patron should expect to find books on a particular subject shelved together and not separated by arbitrary changes in classification practices. Since, however, in each of the libraries there is substantial precedent for minor dislocations resulting from periodic revisions or alterations to the cataloging scheme followed, it appears reasonable to assume that the creation of additional dislocations of this genre would not, in itself, prohibit further centralization of cataloging. It is believed that most of the dislocations resulting from the establishment of a uniform set of classification practices would fall into this category.

Nonetheless, and in spite of the fact that the three libraries, in devising a uniform classification scheme, would unquestionably give special attention to the dissimilarities of their classified collections, subject displacements of some measure would still result in each system as a consequence of centralized cataloging. These would, in turn, lead to dislocation on the shelves—new material classified in science, for example, would not be shelved with old material of the same sort classed in technology.

Since the magnitude of these shelf dislocations in the three libraries could not be estimated short of establishing a common classification scheme, research into the seriousness of the problems they presented had to be essentially qualitative. That investigation showed that responsible officials within the three systems expected that the working out of an acceptable set of common cataloging practices for their systems could be achieved and that measures could be employed to ease the more obvious dislocations.

There are two broad alternative courses of action available to ease these disruptions in shelf organization: either reclassify old material to eradicate the dislocations, or attempt to blunt the effect of the dislocations with public service innovations. One such innovation would be to put a "dummy book" among one set of dislocated books directing patrons to the other location(s) of books on the same subject.

Another would be to install, particularly in the larger branches, shelf directories that would indicate the several locations of dislocated material. These and other devices are preferable to reclassification, which is expensive and time consuming, involving as it does at least the renumbering of books and possibly of catalog cards throughout a system.

The dislocations in card catalogs resulting from changes in rules of entry that would accompany the establishment of uniform cataloging practices for the New York City libraries can be handled in one of three ways: existing card catalogs in each branch, agency or division, as well as the official and public catalogs in each system, can be edited to conform with entries on cards produced at the cataloging center; cards produced at the center can be filed separately, thus generating two card catalogs wherever one now exists; or, third, the dislocations can be avoided by having the cataloging center produce book catalogs instead of catalog cards and thereby provide the mechanism for accomplishing a complete break with the historical card catalogs.

The second alternative above appears to be completely unacceptable in terms of the needs of patrons and demands on the staffs of large public libraries. The first alternative seems to be less desirable than the third alternative. (The reasons for this are discussed in the next section under catalog production and maintenance.) Nonetheless, two solutions to the problems associated with historical card catalog dislocations are available to the libraries.

In terms of all three considerations then—duplication of cataloging effort, the economic size of a cataloging center, and differences in cataloging practices—it appears both feasible and desirable to further centralize cataloging for the three public library systems.

Catalog Production and Maintenance

A tri-system union catalog in book form, marked to show the holdings of the three libraries, is the proposed form of output of the single cataloging center.

This recommendation is the consequence of a small number of pervasive conclusions. First, centralization of cataloging for multi-branch libraries with large historical card catalogs, such as those in New York City, is best accomplished through adoption of the book catalog as the form of centralized output. Second, the book catalog appears to be an acceptable alternative to card catalogs for the needs of the patrons and staffs of large public libraries. Third, the book catalog offers the prospect of substantial savings resulting from the eventual elimination of card catalog filing and maintenance. Fourth, a union book catalog for the public libraries of New York City is more desirable than three separate system union book catalogs. While the recommendation above does not mention computers, it will be apparent as the implications of the proposal are set forth that the basic suggestions as made in this report, with the exception of the centralization of the cataloging effort itself, are dependent upon the computer for their efficient performance. The rationale for each of the above conclusions is elaborated on below. Following that, the proposed book catalog is discussed in some detail.

Book Catalog Production Versus Card Catalog Revision. Although the editing of each and every card catalog in the three library systems to permit the interfiling of cards produced at the cataloging center is theoretically not impossible, it does not appear as desirable as the adoption of the book catalog as the form of centralized output. In the first place, the revision of all card catalogs in the public libraries in New York City would be a costly undertaking. Secondly, further centralization resulting in catalog card production would offer no prospect for improved benefits to patrons other than the fact that the new titles cataloged would have the same class number in the three library systems; centralization resulting in book catalogs, on the other hand, opens up new opportunities for innovative library service based on the additional information that will be available to patrons and the virtually unlimited mobility of the book form of catalog.

Book Catalogs Versus Card Catalogs. In considering the possible forms of catalogs which might be recommended in connection with this study, particular attention was paid to the book catalog and its apparent advantages and disadvantages in relation to the card catalog determined.

The advantages appear to be:

1. The book catalog is easier to use. The ability to scan a great number of items presented on the book pages appears to offer substantial advantages. In addition, certain tests have shown that the look-up time for an item in a book catalog is shorter than that of a card catalog.

2. Where copying equipment, such as Xerox, is available, it is easier and quicker to copy pages of the book catalog containing desired references than it is to copy references from the card catalog.

3. Deterioration due to natural causes is virtually eliminated. Periodic reprintings provide a continual refurbishing of the catalog.

4. It apparently saves staff time. Catalog card filing and maintenance is eliminated. Copies of the catalog can be provided specifically for staff use and conveniently located to save walking to and from the card catalog.

5. It is feasible to distribute copies of a union catalog in book form wherever there is need or demand for the expanded information it provides.

6. A union book catalog should conceivably have some value as a selection tool for library staffs, as well as make available to library patrons—assuming good interlibrary loan provisions—resources beyond their individual systems.

7. Consistent form for all entries is obtainable. If a change in format is decided upon, the periodic reprinting of the catalog provides the opportunity for printing all entries, new as well as old, in the same format.

8. Less space is required for a book catalog than for a card catalog.

The disadvantages appear to be:

1. Adoption of a book catalog increases the number of places in which patrons and personnel may have to search to find bibliographic and/or holdings information.

2. In a divided book catalog, which for economy's sake does not have full entries in each of its

sections, a double look-up may sometimes be required to obtain full information. (This appears not to be an important disadvantage. The material likely to be omitted in the condensed entries is mainly of interest to the staff rather than to the public, and the staff is usually working with the main entry, which would normally be the entry with full information.)

3. It is more easily defaced and may necessitate that a library provide inexpensive, high-quality copying service.

An additional disadvantage results if the book catalog is a union catalog and does not contain branch holdings symbols.

4. If a reader is interested only in titles held at a specific branch or agency, then the additional titles shown in the union catalog are not an asset for him. Not only may he have to scan a number of titles which are not held at his branch, but he will not immediately be able to tell—as he now can with a card catalog—whether or not a book is owned by his branch. This disadvantage appears to be especially significant for children using the facilities of a branch juvenile collection.

The fourth disadvantage listed above raises the important question as to how a city-wide union book catalog that only contains system holdings symbols would be used and how satisfactory it would be as a replacement for card catalogs in individual libraries.

A provisional judgment is offered concerning the way in which the book form catalog proposed here would affect usage. The procedure followed might be (1) the patron finds a title in the catalog; (2) he goes to the shelves to see if the book is there; (3) if it is not there he asks for it at the desk; (4) either it is out on circulation or it is held at another branch within the system or at one of the other libraries (the patron does not really care which is the case so long as the library will get it for him); (5) the librarian, by use of a shelf list and/or a union holdings list printed for staff use, finds out where the book is obtainable. This procedure is not altogether different from that currently followed in the branches of the library systems, so that it appears that a city-wide union book catalog might be a satisfactory replacement to the card catalogs even though specific branch holdings are not marked in the book catalog.

Card Catalog Filing and Maintenance. The three library systems spent an estimated $243,000 in 1964-65 to file new additions and remove withdrawals from their card catalogs and shelf-list files. This is in addition to the estimated $55,000 that was spent by the cataloging departments of the three systems for the maintenance of catalogs and files for which they are responsible. (The $243,000 does not include the cost of additional maintenance and editing of branch and central division card catalogs, which it was not possible to evaluate. See Appendix A.) The production of a book catalog would immediately effect a 60% reduction in the cost of catalog filing in that it would eliminate all card filing for new items acquired with the exception of the shelf-list card. With time, the book catalog will represent an increasing percentage of branch and central division holdings and additional card filing savings will be realized as fewer and fewer title deletions require withdrawals of main and added entry cards from catalogs.

City-wide Book Catalog Versus System Book Catalogs. A union book catalog provides a valuable new service not available now. A city-wide union catalog should be a valuable bibliographic tool for identifying titles bearing on certain subjects regardless of the location of the books or whether they are part of circulating or reserve collections. In addition, a city-wide catalog supplemented by holdings printouts, provides a location device never available before and could have an important bearing on interlibrary loan procedures. The greater the scope of the union effect, the greater the likelihood that this new service will be of major significance.

However, the use of a tri-system union book catalog as against separate system book catalogs is not proposed solely on the basis of its potential for additional service. If book catalogs are to be used, then their use in union form is an economic necessity because of the high cost of printing these catalogs; it becomes necessary to accept both the advantages and disadvantages of union catalogs and to make the best provision for using them not only in a situation where the union catalog is the most appropriate and valuable tool but also in the situation where the catalog of a specific branch or division might be more convenient.

If one could have union book catalogs and individual library catalogs for each library that would be the ideal solution. However, the total cost would be too great. As Appendix F indicates, three systems' book catalogs would cost approximately $13,000 more per year to produce than the tri-system union catalog would cost.

Description of Tri-System Union Book Catalog

It is proposed that a book catalog, consisting of a main catalog and supplements, be produced containing all titles acquired after establishment of the catalog center that are either "new-to-system" or "new-to-city." (These two categories of titles are discussed in detail in the chapter on the operation of the cataloging center on pages 31 - 33.) The main catalog will be issued every 15 months. Supplements will be issued monthly and, like the main catalog, will be cumulative; that is, supplements will contain everything that has been cataloged at the center since the issuance of the last main catalog. Each main catalog and supplement will show system symbols to identify the one, two or three systems holding the title. The appearance of a system symbol next to an entry in the catalog would mean that the title is held either at the system central library or in one or more of the system's branches. Separate book catalogs will be produced for adult and juvenile titles and all catalogs will be divided catalogs—that is, the catalogs will consist of three alphabetic listings, one by author, one by title and one by subject.

Because the main catalog will eventually require a total reprinting of everything acquired in a period stretching many years back, the cost of the photo offset and printing process (that takes place after the master copy is printed on the computer) is very high, and every effort must be made to reduce this cost. The proposed solution is that for each item listed in the catalog only the main entry be shown in full. Each of the added entries will be condensed. With this scheme, it is quite feasible to achieve a printing density of 30 entries per page for main entries and 60 entries per page for added entries on a page size of 8 1/2 by 11 inches. With careful attention to format and typography even higher densities are achievable.

For the large majority of users the condensed entries in the catalog will provide sufficient information, and reference to the main entry will not be needed. To facilitate the second look-up when full bibliographic information is desired, the page and line number of the full entry will be provided at every condensed entry.

> The "Constant Volume Catalog." A constant volume book catalog is one that always contains the most recently acquired titles and the most active older ones while maintaining approximately the same number of total entries that have to be printed. It is achieved by selective retirement of a sufficient number of previously entered titles to provide for the cataloging output of the current cumulation period.

Another recommendation aimed at reducing the cost of catalog printing is that the main catalog not continue indefinitely to represent a total cumulation of all titles acquired (and still held) from the start of the cataloging center. It is obvious that after a period of many years this catalog will be extremely large and the printing cost will be prohibitively high. It is proposed that continuous cumulation in the main catalog proceed for ten years following centralization. During this ten year period, each main catalog produced can be discarded as soon as the subsequent cumulative main catalog is issued. The main catalog produced at the end of ten years will, however, be saved. From that point on each reprinting of the main catalog will entail the dropping of a sufficient quantity of the oldest entries[1] to compensate for the volume of new material added. The entries dropped can be found in the tenth year main catalog, which will have been saved to perform this backstopping function. Each main catalog issued after the tenth year of centralized cataloging will be backstopped by the first ten year catalog until about the twentieth year of centralized cataloging. At that time, the main catalog produced at the end of the second ten year period will be saved and the third ten year period of main catalogs will be started.

Thus, at the end of each decade an additional catalog in which to search is generated. If it seems desirable to hold the number of potential places to search constant, a total accumulation could be made at the end of 20 years, 30 years, etc., to combine the several ten year catalogs that have been saved to backstop the current main catalogs. Such a total accumulation would contain all titles cataloged (and still held) from the start of centralization and would therefore replace the two or more ten year catalogs as a backstop to the then current main catalogs. Investigation of patterns of book catalog usage following centralization should serve as the basis for evaluating the need for such total accumulations, as well as the other variations mentioned below. A graphic presentation of the monthly supplements, main catalogs and potential total accumulations as described above is given in Figure 1.

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[1] Some important entries should not be dropped when the main catalog is recumulated but should be continued indefinitely. There will be provisions in the computer-system for so designating such entries.

Many variations on the ten year cumulation scheme proposed here are possible and these are discussed in Appendix F. An obvious variation is simply to increase the time span of cumulation from 10 to 15 or 20 years. A reduction in the number of places to search can be obtained at rather moderate cost increases by using a 20 year cumulation period and printing all entries more than ten years old in extremely condensed form as single line entries. This would cost somewhat more than the scheme proposed here but not nearly as much more as a 20 year catalog without the additional condensation. However, for cost evaluation in this report, the catalog as specified above is used.

Insofar as the number of holdings symbols recommended for inclusion in the city-wide union catalog is small enough so as not to require the printing of an additional line in each entry, it is proposed that the system holdings information in the book catalog be shown at both main and condensed entries.

For titles shown in the monthly supplements, system holdings symbols will always be reasonably accurate and up to date. The holdings indications appearing in a main catalog on the other hand, can be out of date by nearly as much as 15 months since there is not way of efficiently updating this information until the next main catalog is printed. No attempt to compensate for this will be made with materials for general distribution. However, branch staffs will receive periodic listings of changes to the system holdings indications shown in the latest main catalog. These staffs would thus be able to update manually the holdings symbols in their master copies of the main catalog. This marking task should be minimal. In all probability it will attain substantial volume only at the beginning of a new main catalog cumulation period when one system is acquiring for the first time some titles which were acquired by one of two of the other systems at the end of the previous main catalog cumulation period.

If a title is totally deleted from a library's collection, this fact will not be reflected in the main catalog's holdings symbols until the next main catalog printing. As with holdings changes due to acquisition of new titles by a system, necessary updating to interloan and cataloging center copies of the main catalog will have to be accomplished

Figure 1

TRI-SYSTEM CATALOG COMPONENTS

Components of Union Book Catalog

Discard
first 15 months' cumulative monthly supplement
1 main catalog
monthly supplements
1 2 main catalog
monthly supplements
1 2 3 main catalog
. . .
1 2 3 4 main catalog (fifth year)
1 2 3 4 5
1 2 3 4 5 6
1 2 3 4 5 6 7

Retain 1 2 3 4 5 6 7 8 tenth year main catalog

Total Catalog Components

1. Historical catalog
2. Main catalog (buildup period)
3. Supplement

Discard
2 3 4 5 6 7 8 9
3 4 5 6 7 8 9 10
4 5 6 7 8 9 10 11
5 6 7 8 9 10 11 12
6 7 8 9 10 11 12 13
7 8 9 10 11 12 13 14
8 9 10 11 12 13 14 15

Retain 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 twentieth year main catalog

1. Historical catalog
2. Tenth year main catalog
3. Main catalog (constant volume)
4. Supplement

Discard
10 11 12 13 14 15 16 17
11 12 13 14 15 16 17 18
12 13 14 15 16 17 18 19
.
.
.

manually in the interim. This should not be a major problem, however, since there should be no difficulty in timing most deletions to coincide with the next printing of the main catalog.

Arguments have been advanced to the effect that it may not be necessary to go to the trouble of showing the current holdings at all in union catalogs serving libraries of such proximity as those in New York City, especially when specific branch holdings are not going to be indicated in any case. There may be some validity to this argument. However, since this point of view is by no means established, the provision for holdings information has been included in the system proposed to maximize the probability that the book catalogs will be satisfactory replacements for card catalogs.

Although the catalog proposed here will contain only three holdings symbols, as many as 20 symbols can be shown per full entry without incurring any penalty save perhaps a somewhat less readable catalog page. (The more significant penalty relates to the condensed entries, where the inclusion of as many as 20 symbols would require the printing of one additional line per entry. This would increase the cost of the proposed catalog by approximately 20%. This cost increase could be avoided, however, by showing holdings symbols only at the main entry.) It may well be that substantial improvements to the value of the information the catalog provides the patron and/or staff could be achieved by using additional symbols under special conditions. One such circumstance will be described below in the discussion of the treatment of "new-to-system" titles.

Other Outputs of Proposed Cataloging Center

Shelf-List Cards. Every branch and central division will be provided with one shelf-list card for each new title it acquires, and will be expected to maintain a card shelf-list. Shelf-list cards that are issued prior to the appearance of the corresponding entry in the monthly supplement will be coded to enable library staffs to identify the supplement in which such entries will first appear. When a branch or central division receives such coded cards, the staff should not file them into the shelf list but should file them separately—alphabetically by title or author within code—until the appropriate supplement is received. This procedure will enable the staff to assist patrons in locating new material that has not yet appeared in the book catalog. When a branch or division receives an uncoded shelf-list card, the staff will know that the corresponding entry has already appeared in either the cumulative supplement or the main catalog and that the shelf-list card does not have to be temporarily segregated from the shelf-list file.

Notice of removal of the last copy of a title from an agency will be given to the cataloging center by return of the shelf-list card for that title. Agencies will be able to request new or replacement shelf-list cards from the center. In addition a union shelf-list will be prepared for staff use at the cataloging center.

Special Materials for Staff Use. In addition to the change in holdings notices to the main catalog which have been described, a complete holdings list showing city-wide branch holdings for each title will be provided for the cataloging center and other locations throughout the systems where it is deemed to be useful. In this connection, it should be indicated that it is feasible to establish a city-wide telephone information unit at the cataloging center to answer staff and partron queries on locations of titles. This unit's telephone number could be printed in the book catalogs, and would offer the prospect of reducing the number of holdings inquiries directed to branch and central staffs. The potential uses of such a centralized information bank could also extend into the filling of branch interloan requests, either on a system or city-wide basis. The detailed holdings listings would not be printed in as large a volume as the catalogs and the printing costs should be moderate. The number of pages in each listing should not be great; the only information shown will be title, author, the identifying item number and the holdings symbols. The sequence will be alphabetic, either by title or by author. The printing configuration for these lists will parallel the supplement and main breakdown that has been described for the book catalog with the exception that cumulative supplement printings will include all titles that have undergone holdings changes since the last supplement printing and not just newly acquired titles.

Historical Catalog Conversion

One of the basic questions associated with a decision to centralize cataloging for the three public libraries under one center producing a tri-system union book catalog relates to the conversion, if any, that should be made of the catalog copy for library materials in each system acquired prior to this centralization. A wide range of historical card catalog conversion alternatives are available, and these are presented in some detail in Appendix D. The discussion below presents a plan for conversion of this material into the book catalog that evolved through a series of meetings with Public Service personnel in each of the systems.

Whenever a centralized cataloging center would be established, the systems' historical card catalogs would contain entries for materials of varying longevity and value. This, coupled with the fact that the initial operating period of the cataloging center would probably be especially troublesome, argues for a phased conversion scheme that would, on the one hand, make the book catalog more immediately useful and that would on the other, not overburden the new center with a massive conversion effort.

The utility of the book catalog to the staffs of the three libraries depends, in addition to the factors already discussed, on two considerations tied to the re-ordering of old material: since titles contained in the book catalog can be ordered by an identifying item number, thus saving considerable process time, it is desirable to have as many titles as possible that are frequently re-ordered contained in the book catalog; furthermore it is desirable that all titles purchased for a new branch be included in the book catalog so that branches opened after centralization can begin operations without any card catalogs whatsoever. It appears that a partial conversion of entries in the historical card catalogs that would accomplish both the above objectives can be built around the subject replacement lists that are issued each year by the systems. If the libraries were to prepare combined replacement lists covering standard titles that are frequently re-ordered and often purchased for new branch collections, these lists could readily constitute the first phase of the conversion of the historical card catalogs to book form. Such lists, which would be issued annually to the branches for ordering, could be quite extensive without running the risk of swamping the cataloging center staff.

The conversion of titles on subject replacement lists would be accomplished by editing for computer input the one, two or three card main entries for the title as they appear in the systems' historical catalogs. Each converted entry would appear in the book catalog (supplements and main) with the call numbers under which it is shelved in each system. These call numbers would be identified by the system holdings symbols. All titles appearing on these replacement lists would be converted whether or not they were ordered by branch or division librarians when the lists are issued. After the supplement or main book catalog containing these converted items was distributed in the systems, notices would be sent to all agencies requesting that they withdraw the appropriate main and added entry cards from their historical catalogs.

This phased conversion could extend to all replacement lists issued after centralization that contain titles not yet entered in the book catalog. This procedure might parallel the first few years of cataloging center operations. Librarians in the systems expressed the belief that such a plan would virtually insure, two to three years after centralization, that the bulk of added copy orders generated in the systems would be for material already in the book catalog. Thus, decisions regarding the desirability of converting the rest of the material in the historical catalogs—and the conversion described above would only eliminate a small portion of the three official catalogs —could comfortably be postponed until the significance of the book catalog had been fully assessed. Some or all of this remaining material might never be transferred from the card catalog to the tri-system union book catalog. Perhaps only the specialized collections in each system would be converted in that they probably constitute the essence of what is least known about the breadth and depth of the libraries' resources. These and other alternatives would have to be evaluated in the light of the new dimension of patron and staff needs that the adoption of the book catalog would unveil.

ACQUISITIONS

A single acquisitions center, sharing the facilities of the cataloging center and extensively employing the center's EDP equipment, is recommended to meet the needs of the public libraries of New York City.

Having reached the conclusion that the cataloging needs of the New York City public libraries would best be met by one centralized cataloging center, it seemed wise to consider the centralization of acquisitions alongside the cataloging function. The desirability of further centralizing the acquisitions function depends essentially upon considerations of effective communication between these two interrealted components of the processing cycle and the economic size of an acquisition center.

Communication. There are many and varied links connecting the acquisition function to the cataloging function. Several of the catalogs and files that are employed by the acquisition departments in identifying new material received "automatically" from publishers and in searching branch orders are essentially maintained by the catalog departments. A not inconsiderable amount of paperwork must flow between the two operations. If acquisition activities were not further centralized and cataloging were, it is likely that the economic advantages associated with additional cataloging centralization would be diminished by the additional impediments to effective coordination of these two functions and by the necessity for duplication of efforts. Thus, even if there were no improvements in economy resulting from further centralization of acquisitions, it would still be desirable to centralize acquisitions with cataloging to achieve the full benefits of cataloging centralization. It appears, however, that centralization of the acquisition activities of the three systems would result in savings beyond those connected with the cataloging center.

Economic Size. Much of the activity in acquisitions is easily adaptable to EDP equipment. This applies to the heavy record keeping connected with gifts and non-book materials as well as to the tasks required in the acquisition of new and added copy titles. It is estimated that a single city-wide center for acquisitions using EDP equipment would result in substantial savings—some 16% of total current acquisition costs. Moreover, though it is possible that a conventional operation attempting to place more than 200,000 purchase orders a year for over 1,000,000 items might be overburdened with paperwork, this is not likely if EDP equipment is extensively employed. Such work loads are not great by EDP standards. Since the use of EDP equipment is an integral part of the operation of the proposed cataloging center, economies in equipment costs could be achieved by having the same equipment serve both the cataloging and acquisition operations. Though it would be possible, as an alternative, to have the equipment at one of the separated operations only and ship information and EDP output back and forth as required, this would add to the complexity and costs of both operations.

Besides the operating savings, there are advantages per se in being a large purchaser. It is possible that some increase in the purchase discount received for the items bought could be achieved when purchasing is handled by a single purchasing center. It also seems likely that a single large acquisition center would tend to get quicker and better service from vendors than would three purchasing operations buying the same amount. On the basis of research it was not possible to quantify these advantages in dollars, but their likelihood made it even more desirable to recommend a single acquisition center.

Book Selection. As was indicated in the review of the elements of the processing cycle, book selection itself—including reviewing and decision-making —was not included in the scope of the study. Because of the many close ties between the acquisition function and the process of selecting material suitable for system-wide or agency ordering, book selection quite naturally became a point of interest when the decision to centralize acquisition activities at the cataloging center was reached. Nonetheless, the following remarks are not to be construed as recommendations but as observations perhaps deserving further exploration.

It is entirely possible to centralize the acquisitions activities of the three systems without altering book selection procedures. The recommendations in this report assume that no such alterations will be made, as will be clear in the subsequent description of the operations of the proposed network. It will be equally evident, however, that very substantial additional benefits would be realized from the proposed reorganization of technical processing in terms of both the cost and speed criteria, if the triplication of effort and paperwork that separate system selection of thousands of identical titles entails could be eliminated or at least reduced.

There is substantial sentiment within the three libraries for some attempt at centralizing selection. There are also several significant problems facing such efforts. If these issues can be resolved in a manner that preserves the integrity of each system's selection process, both the libraries' patrons and staffs stand to gain greater advantages from the further centralization along the lines this report recommends.

PREPARATION AND DELIVERY

It is recommended that the three system preparation departments not be further centralized until the cataloging-acquisition center is fully operational.

The desirability of establishing one physicial preparation center for the three public libraries hinges on factors that are considerably more marginal than those supporting further centralization of cataloging and acquisitions. For one thing, although it is possible that additional economies in preparation activities could be gained merely by increasing the annual volume of items prepared, such potential economies remain unverified. Furthermore, in preparation, unlike cataloging and acquisitions, there is virtually no tri-system duplication of effort that would be eliminated by further centralization, save set-up time on the assembly line. Secondly, whereas EDP equipment can dramatically alter the nature of catalog production and maintenance and acquisition operations, such equipment does not have as wide an application in the preparation function. (Its primary contribution in the preparation cycle is the computer-printing of labels for book pockets, book cards and book spines.) Finally, delivery does not play a decisive role in determining the optimum number of preparation centers since, for urban systems of this size and proximity, delivery in any case would continue to be performed by truck fleets owned and run by the libraries. It develops that the issue most influencing the desirability of establishing one physical preparation center is the amount and kind of communication linking the cataloging-acquisition center to the preparation function.

Communication. A considerable degree of detailed communication, as well as shipments of materials, must link the centralized cataloging-acquisition center to whatever preparation centers are employed. In addition to the normal level of communication connecting these two interrelated functions, it seems reasonable to expect that some mistakes will be made in the course of the overall processing operation—materials for book preparation might be sent to the wrong center by the centralized cataloging staff, materials sent may be incomplete or incorrect, and so on. It also seems reasonable to think that the number of errors and the resulting preparation delays, as well as the time expended for standard communication, will increase as the number of preparation centers increases. Thus, the amount and kind of communication that develops between the cataloging-acquisition center and a configuration of preparation centers argues for minimizing the number of preparation centers.

Although there would appear to be long term advantages of efficiency, quality of output and perhaps cost in having a single preparation center, it does not seem wise to undertake the planning of further centralization in this sphere until the cataloging-acquisition center is firmly established as an operating entity. The marginal economies to be secured in moving from three preparation centers to one do not justify the costly delays that might ensue in completing centralization of the other processing functions. Moreover, postponing further centralization of preparation will provide valuable time in which to assess the optimum location of a single preparation center vis-a-vis the cataloging-acquisition center, and will enable the libraries to determine more accurately the excess capacity a single preparation center should have, both for the future needs of the three libraries and for the potential subcontract of preparation services to non-public libraries in New York City.

Chapter III

SUGGESTED OPERATING PROCEDURES

This chapter of the report discusses the operations of the proposed computer-based network in terms of acquisition, preparation and delivery, cataloging, the administrative outputs produced by the computer-system, accounting procedures, and the functions that will be performed by professional and clerical staff of the cataloging-acquisition center. The chapter concludes with a diagram of the proposed network structure and work flow. A detailed description of the internal EDP flow is contained in Appendix E.

ACQUISITION

Central to the functioning of the entire technical processing network is a computer-maintained master file of all titles cataloged or converted after centralization. A title may be a book, serial, film, record, or other non-book item. Ordinarily, titles are entered onto the master file upon receipt of Library of Congress catalog copy, automatic receipt of books from publishers, or receipt of an on-approval order from a branch or central division, whichever occurs first. Titles may also enter the file as a result of conversion of historical card catalog material.

Every title entered onto the master file is assigned a unique "item number." Whenever the Library of Congress card number is known, it will be used as the item number. If an LC number is not available, a New York City item number will be assigned. If an LC number subsequently becomes available, this "temporary" item number will be replaced by the LC number.

Library of Congress Copy

The computer-system has been designed with the expectation that Library of Congress copy will be available in machine readable form, but the absence of machine readable copy does not in any way negate the system design. Provision has been made for extracting catalog information from Library of Congress machine readable copy and entering it onto the item master file.

Books Received Automatically

The cataloging-acquisition center will automatically receive new titles from publishers, either through the Greenaway Plan as automatic on-approvals, or as gifts. If the title has not already been entered onto the master file as a result of receipt of Library of Congress copy, then a new title notice will be prepared to enter the title onto the master file.

The cataloging-acquisition center will request publishers to send it four copies of titles sent automatically. (If less than four copies of a title are received, additional copies required for selection will be ordered on approval.) The computer, upon receipt of the new-title notice will generate multiple order cards, showing the author, title, publisher, list price and item number. One of these cards will be inserted in each copy of the title received automatically. The staff of the centralized acquisition unit will also insert available reviews and notices in each copy of the title. Finally, a representative of each system will decide which of the new titles require system staff review and, in those cases, will assign a reviewer from his system. These books will be delivered by truck from the center to the reviewer's agency. The other new titles will be delivered to each system center for selection and order "passing". The fourth copy of each automatic title received would be sent to the centralized cataloging unit marked for "immediate" or "await-demand" cataloging. After system selection, if that occurs prior to ordering, books not recommended for ordering, along with the multiple order cards would be returned to the center for return to the supplier or for disposal. After "passing" the multiple order cards would be returned to the cataloging-acquisiton center as input to the computer for ordering and status file updating. The display copies of ordered books would be sent to the respective system prepration centers to await receipt of the quantity shipments from suppliers. It is expected that the "passing" period for branch ordering in each system will be of one week's duration.

In those instances in which selection precedes branch ordering, the center can prepare selection lists from the returned pre-punched multiple order cards. Those titles selected will have the corresponding system multiple order card punched with a "select" code before being entered into the computer. The computer-produced selection lists will be distributed to all branches of the systems and will serve as notices to librarians that the listed books are on display at the "passing" room and may be ordered there via the inserted second copy of the multiple order card.

Special Orders

Any title not currently on the master file can be entered by means of an on-approval order origniated by authorized library personnel.

Branches and central agencies can order added copies by sending the order card directly to the centralized acquisition unit. If the item number assigned to the title is known either from the book catalog or some other source, it should appear on the special order. If the item number is not know, or if the title is still part of the historical card catalog, the branch should indicate the title, author, publisher, edition and copyright date, if this is know, on the special order form. These orders without item numbers will be clerically searched at the center to verify that the title has, in fact, not yet received an item number and that the title is approved for ordering in the system from which the special order was received. If the title does have an item number, this will be punched on the special order card and entered into the computer. In this case, the search for system approval will be performed by the machine.

Supplier Assignment

When a new item is entered onto the master file or when the first order is received, whichever time proves most expedient, a supplier is assigned for the particular item. This supplier code will be used in the processing of orders until such time as it is changed. Present information indicates that publisher may be indicated on Library of Congress machine readable copy in coded form. This could allow a look-up by publisher, and perhaps class number also, for automatic machine assignment of supplier. This would be desirable since it will allow completely automatic entry of Library of Congress copy.

The question of supplier assignment, however, and whether machine assignment of supplier is desirable or possible is a question which needs further investigation. It is very likely, for example, that a considerable portion of orders will be placed by telephone by the staff of the centralized acquisition unit. In other cases, requisitions will be accumulated in the machine by supplier, system and item number, and orders sent to the supplier. The machine will prepare the necessary mailing labels for mailing the orders to the suppliers.

Serial Subscription Renewal

A machine record will be maintained by library branch of all serial subscriptions currently in force. A record of renewal date also will be kept. Sometime before renewal is due, notice of pending renewal will be sent to branches. If no cancellation is received, renewals will be sent to suppliers. The machine will keep a record of current subscription rates. Billing by suppliers will be machine checked against a machine calculated billing, and difference, if any, will be examined by the accounting department. If payment is authorized then checks will be sent to suppliers as described below and the amounts will be charged against branch budgets and the systems billed accordingly.

PREPARATION AND DELIVERY

After the computer has printed an order (or an order has been placed by telephone), a receiving card and branch shipment card are prepared and delivered to the appropriate system preparation center where they are filed by title to await shipment of the material ordered. Each card shows, where applicable, the title, author, item number, edition, publisher, supplier, order number, copyright date, ordering agency or agencies and number of copies ordered. If the title has already been cataloged, then book pocket labels, book card labels, and spine labels are sent at the same time. If the title is new to any of the ordering branches, then shelf-list cards are also sent. If the title has not been cataloged, then the labels and cards are printed and sent to the preparation center after cataloging is completed. These materials are either filed with, or filed separately and indexed to the corresponding receiving and branch shipment cards.

When a supplier-shipment arrives at a preparation center, the receiving card is removed and returned to the cataloging-acquisition center. If an invoice comes with the books, it is forwarded to the accounting department at the center. If the shipment is received exactly as ordered nothing is added to the returned card. Otherwise, deficiencies are indicated. If fewer books are received than were ordered, another pair of receiving and branch shipment cards is sent to the preparation center to be used with the remainder of the order.

The receiving card notifies the center of receipt of books and is used to update computer-maintained outstanding order files and status files. Periodically, an outstanding order report and overdue orders report are prepared for the centralized acquisition unit. These are reviewed for necessary action, including possible changes in supplier assignment on the master file. Overdue notices to suppliers will automatically be prepared by the computer-system. Such notices could either be sent directly to the appropriate vendors without further human intervention, other than the placing of the notices in envelopes, or alternatively, could be set aside for staff follow-up and judgmental decisions.

The branch shipment card is placed in the lead copy of the books and stays with it during preparation. When preparation is completed, this card is sent back to the cataloging-acquisition center to indicate shipment to the ordering branch or branches.

Serials Check-In.

A supply of receiving cards and labels for some appropriate period of time will be sent to the preparation centers if the serials are to be processed there. In case of serials sent direct to branches no labels or receiving cards will be prepared. Receiving cards will not be returned to the center to report branch shipments. They will only be returned if an issue of a serial is not received. The computer-system will record receipt of the issue unless it receives a notice of non-receipt. When such notices are received, reminders to suppliers will be generated.

CATALOGING

New and Duplicate Title Searching

When a title (either the material itself, in the case of new title search, or the order card, for added copy search) is received at the centralized cataloging unit, it will have to be searched in a tri-system union catalog. This union catalog will be created by inter-filing Xerox reproductions of the main entry cards (including the branch holdings card) from the three systems' official card catalogs and by pulling all main entries for each title together by eliminating "double" cross reference. Which cross references are withdrawn will be determined by the common rules of entry established for the cataloging center. If the title being searched is not found in this tri-system union catalog, it will be treated as a "new-to-city" title. If it is found to be held by the system or systems currently ordering the title, it will be treated as a "system duplicate copy" title. If the title is not held by the system currently ordering it, but is held by another system, it will be treated as a "new-to-system" title.

"New-to-City" Titles. Such titles will be cataloged in the centralized cataloging center. Original cataloging for these titles will be minimized by making maximum use of available catalog copy. Cataloging practices will conform to the common scheme established by the systems; LC subject headings will be followed. These titles will appear in the book catalogs with symbols to identify those systems in the city that hold the title.

"System Duplicate Copy" Titles. If the agency that has ordered the duplicate copy already holds the title (as shown on the branch holdings card in the tri-system union card catalog) the book will merely be prepared and shipped to the agency. If the agency does not already hold the title, a card set will be generated from the system main entry and sent with the prepared book to the ordering agency. The holdings record in the tri-system union card catalog will be uptdated. No new cataloging will be performed on "system duplicate copy" titles. Such titles will not appear in the book catalog unless they are part of a subject replacement list scheduled for conversion.

"New-to-System" Titles. A title that is new to the system ordering it but not new to all three systems in the city will be cataloged in the centralized cataloging center. Original cataloging for these titles will be minimized by making maximum use of available catalog copy (including the main entries from the tri-system union). These titles will appear in the book catalog with symbols to identify the system or systems that have acquired the title after centralization. The book catalog will also show a special symbol, such as an asterisk, to indicate that the title is held by one or two of the systems as part of its historical card catalog collection. This will indicate to the patrons and staff that they must check the system's card catalog to get the call number under which the title is shelved in the system(s) exhibiting the special symbol.

In the discussion above, the "new-to-city" titles represented only titles acquired after centralization that are not held in the city. The other two categories of titles are special categories that pertain to the initial phases of centralization when there may be substantial purchasing of titles initially acquired by one or more of the systems prior to centralization. The volume of titles in these special categories will drop rapidly after two to three years of centralization. This will be especially true if the subject replacement lists are used as the basis of a limited initial conversion of titles held in the historical card catalogs. The two special categories of titles can be viewed as evolving into a fourth category with increasing age of centralization. These are titles that are "duplicates-to-city" but which will have been initially acquired by one or more of the three systems after centralization.

Catalog Work Sheets

For each title that is to be entered into the catalog files, the computer-system will produce a cataloger's work sheet. This work sheet will contain all information currently available on the title in the machine files. This may be only author, title and publisher. If Library of Congress copy has been received for the title, it will be printed on the catalog work sheet. The cataloger would then make necessary changes, add missing information and return the sheet to the computer room for keypunching. If Library of Congress copy is not available, the cataloger will do original cataloging, aided by whatever other copy has been provided by the searching staff. The completed catalog work sheet will provide the information for catalog entry. Serial cataloging and cataloging of non-book material will be carried out as described above. Cataloged serials will appear in the book catalog.

If the practice of using Library of Congress copy unchanged can be adopted, then in cases where Library of Congress copy is available, the production of the catalog work sheet might be bypassed. In such cases, the Library of Congress copy would be reviewed in the proofreading process.

Proofreading

Each day proof copy will be produced for all newly entered catalog work sheets. It will be produced in a sequence which corresponds to the sequence in which the catalog work sheets are clerically filed. It will be sorted so that all entries for a title generated by the machine will be shown together, and it will be formatted for easy proofreading. There will also be a report listing machine detected errors, particularly errors detected by the machine authority file checks. If any such errors are detected, this error report will be presented side-by-side with the proof copy.

ADMINISTRATIVE OUTPUTS

Various outputs will be provided for professional and clerical staff use at the cataloging-acquisition center. The principal ones include listings of machine-maintained authority files, a union shelf list, the city-wide holdings printouts and a daily status report of all currently active items.

The daily status report will list, in alphabetic sequence by title, all items on which there is any current activity. The current status of the item will be shown, including the item's selection status, whether or not it is cataloged, how many copies are on order, how many have been received, how many have been shipped by the preparation centers, and certain information relative to the inclusion of the title on replacement lists. Newly entered items on which no action has been taken will also be shown. Any item to which an item number has been assigned should be present in either the printed catalog or the status report.

Additional reports will include an open order report, a report on orders overdue from suppliers, a report on orders overdue at branches and various file-change audit listings. Finally, the computer will be able to prepare far more extensive cataloging and acquisition statistics than those presently available.

ACCOUNTING

Each few days the accounting department at the cataloging-acquisition center will receive work sheets in sequence by supplier, title and order number. These sheets will list all items still on order with the supplier. An item will be considered to be still on order if all copies requested on an order have not yet been received or if invoices for all copies have not yet been received. For these items the work sheet will show all invoice information already received and all receipts of books reported by the preparation centers. The accounting department will match newly received invoices against these work sheets and charge the invoiced amounts against the proper open orders. This information will be re-entered into the computer and used to update the files. In the following cycle new work sheets showing the latest state of affairs will be printed.

After every line of an invoice has been entered into the machine on one of these order sheets, one more input is required in order for the machine to prepare payment for the invoice. The accounting department must enter an invoice notice. This shows invoice number, total invoice amount and any adjustments including the discount if this is given on an order total basis rather than on an item-by-item basis. This notice serves three purposes: it is the accounting department's authorization to pay the invoice; it is the means of entering adjustments into the machine; it provides a check total, the invoice total, against which the machine can compare the total of all invoice items and adjustments.

Periodically the machine will group all invoices which have been approved for payment and print a payment voucher listing these invoices along with any credits and adjustments and the total to be paid. This will go to the accounting department. If the accounting department approves the voucher it will be re-entered into the system. This is authorization to produce checks. The machine system will print checks corresponding to the voucher totals. It will produce a check register for the accounting department and it will produce mailing labels for sending the checks to the suppliers.

The amounts for individual items on invoices which are entered into the machine on invoice work sheets are credited to the proper supplier and they are also charged to the ordering system. Periodically, statements to the system are prepared and sent along with a portion that can be returned with payment. The payment reports are re-entered to update the files so that the next statement can be properly prepared.

For each of the library systems, inputs are provided with which the library may enter budget information for each branch, indicating budgeted amounts, time period and budget category. The machine will apply orders against these budget amounts to produce a periodic report, by branch, of funds committed, funds expended and remaining budget. The present method of applying percents against list price to obtain cost of book can be continued. If desired, however, there would be no difficulty in using the actual amount billed on the invoice in the budget records.

There will be a periodic reconcilation report for the center's accounting department of amounts paid to suppliers versus amounts billed to the systems.

FUNCTIONS CARRIED OUT BY PROFESSIONAL AND CLERICAL STAFF

The tri-system center for cataloging and acquisition is based upon a combination of conventional clerical and professional techniques and the use of high speed electronic data processing equipment. Conventional techniques are retained where the work requires professional judgment or where a reliable machine technique for carrying out a clerical procedure is not available, or where the input and exception procedures associated with a machine technique would clearly be more onerous than continuation of conventional clerical techniques.

Thus professional human activity is retained for descriptive and subject cataloging and assignment of classification numbers when this information is not available from the Library of Congress. Clerical and semi-professional activity is required in the following areas:

1. Searches by author and title. The majority of these searches will be eliminated by the machine system. Books and other materials will be uniquely identified by an item number. The item number will be either the Library of Congress card number or a number assigned for New York City. As will be shown below this number will be available in most cases and machine searches can be made using this number. However, when this number is not available, the search must be done by author and title. When author and title information originating at different places is to be matched, sufficient uniformity to permit a reliable machine match cannot be expected. An exception is the case when Library of Congress and the center's information are being matched. It should be possible to do machine matching on the outputs of two highly professional agencies working, it is hoped, with a common set of standards. Thus this type of machine searching is planned here. Author and title searches which will have to be done clerically are:

    a. If a book received automatically does not contain the Library of Congress number, it must be searched to determine that it is really new. Searching will be performed in the status report (a generalized in-process report), the tri-system union card catalog and the book catalog. If the Library of Congress number is available machine searches can be made.

    b. Special orders without item number must be searched in the status report and catalogs to determine whether or not an item number has been assigned to the title.

2. Matching of actual books against machine produced records. The process control sheets and labels produced at the computer center will have to be matched against books received at the preparation center. These searches will be made by item number and copyright date.

3. Crediting of items billed on supplier's invoice against the proper order number. This is done clerically in the accounting department.

4. Authorization of payment checks to suppliers. Authorization notices from the accounting department are required at two separate points in the procedure.

5. Clerical or semi-professional origination of changes to the supplier master file, publisher master file, and item master file.

6. Proofreading of catalog copy.

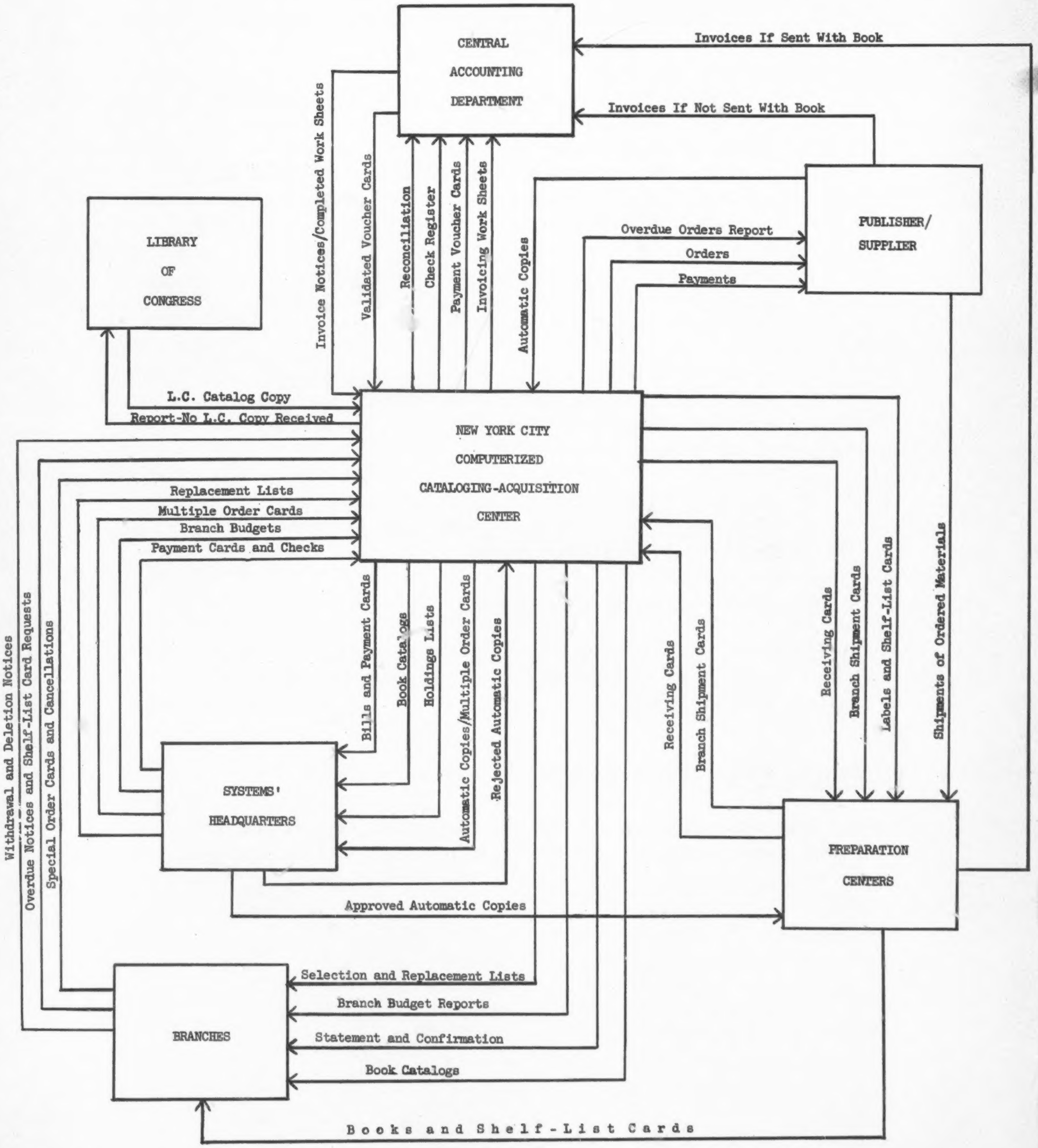
7. Clerical, semi-professional or professional intervention in connection with error reports and other unusual conditions.

NETWORK STRUCTURE AND WORK FLOW

The block diagram on the following page depicts the structure and basic work flow of the proposed technical processing network.

Diagram

NETWORK STRUCTURE AND WORK FLOW


CENTRAL ACCOUNTING DEPARTMENT
LIBRARY OF CONGRESS
PUBLISHER/ SUPPLIER
NEW YORK CITY COMPUTERIZED CATALOGING-ACQUISITION CENTER
SYSTEMS' HEADQUARTERS
PREPARATION CENTERS
BRANCHES
Invoices If Sent With Book
Invoices If Not Sent With Book
Invoice Notices/Completed Work Sheets
Validated Voucher Cards
Reconciliation
Check Register
Payment Voucher Cards
Invoicing Work Sheets
Automatic Copies
Overdue Orders Report
Orders
Payments
L.C. Catalog Copy
Report-No L.C. Copy Received
Replacement Lists
Multiple Order Cards
Branch Budgets
Payment Cards and Checks
Withdrawal and Deletion Notices
Overdue Notices and Shelf-List Card Requests
Special Order Cards and Cancellations
Bills and Payment Cards
Book Catalogs
Holdings Lists
Automatic Copies/Multiple Order Cards
Rejected Automatic Copies
Receiving Cards
Branch Shipment Cards
Receiving Cards
Branch Shipment Cards
Labels and Shelf-List Cards
Shipments of Ordered Materials
Approved Automatic Copies
Selection and Replacement Lists
Branch Budget Reports
Statement and Confirmation
Book Catalogs
Books and Shelf-List Cards

Chapter IV

COSTS AND SAVINGS OF RECOMMENDED NETWORK

Table 1 compares the projected annual operating cost of the recommended city-wide processing network with the present cost of technical processing in the three public libraries in New York City. (A detailed description of the costs associated with the recommended network is contained in Appendix C.)

As Table 1 indicates, a cataloging-acquisition center, tied to the three existing system preparation centers and producing a city-wide union book catalog, could serve the technical processing needs of the public libraries in New York City and achieve an estimated annual operating saving of $425,000. This represents a saving of nearly 22% in the total current cost of processing in the three systems.

The proposed network would realize the greatest portion of these savings from the elimination of duplication of costly cataloging effort, the computerization of many searching procedures and much of the clerical record keeping, and the eventual elimination[1] of card catalog maintenance. It is estimated that the operation of the preparation centers will be slightly more costly than current preparation activities of the systems, largely due to increases in the complexity

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[1] It should be emphasized that the costs shown in Table 1 for the recommended network are for the period of the constant volume book catalog (ten years after centralization). Prior to that time during the "buildup" period, the annual costs of producing the book catalog will be considerably less than as shown in the table (see Part II, Appendix F) and the costs of card catalog production and maintenance considerably more than as shown. Furthermore, it appears that these shifting operating costs and savings largely offset each other during the buildup period, so that an examination of the costs associated with the recommended network after the constant volume book catalog has been attained provide the most accurate comparisons with current costs of technical processing in the three library systems.

Table 1

ELEMENTS OF RECOMMENDED PROCESSING NETWORK AND CATALOG OUTPUT BASED ON 1,000,000 ITEMS[a]

Processing Components	Recommended Form	Annual Operating Costs	
		Recommended Network[b]	At Present
Processing Elements			
Acquisition	one cataloging-acquisition center (with EDP)	$ 360,000	$ 450,000
Cataloging	one cataloging-acquisition center (with EDP)	350,000	660,000
Preparation	three preparation centers	450,000	410,000
Delivery	Truck	25,000	20,000
Sub-total processing elements		$1,185,000	$1,540,000
Catalog Production and Maintenance			
Book Catalog Production		$ 270,000	$ —
Card Catalog Production		—	160,000
Catalog Maintenance		60,000	240,000
Sub-total catalog production and maintenance		$ 330,000	$ 400,000
Total all components		$1,515,000	$1,940,000

a Figures rounded to nearest $5,000.

b Recommended network costs have been broken down by processing components in such a way as to make them comparable to the present costs for these components.

of communication between the cataloging-acquisition center and the preparation centers. The most significant increases in operating costs associated with the recommended network, as shown in Table 1, relate to the production of the union book catalog.

Chapter V

IMPLEMENTATION

This chapter discusses some of the broad questions of implementation of the proposed technical processing network. Although a detailed inquiry into such matters can only be undertaken after some consensus is achieved on the basic recommendations of this report, it is quite possible to set forth now certain predictable time and cost estimates for creation of the tri-system union card catalog, installation of the data processing equipment, and computer-system design and programming, and to list a number of guidelines that should govern the issues that must be resolved.

TRI-SYSTEM CARD CATALOG, INSTALLATION, COMPUTER-SYSTEM DESIGN AND PROGRAMMING TIME AND COSTS

It is estimated that it will cost about $300, 000 to create the tri-system union card catalog that serves as the official catalog at the cataloging-acquisition center. More detailed information on the estimate is included in Appendix C.

Installation of data processing equipment (apart from the cost of renting the equipment itself) will cost an estimated $150, 000. (See Appendix C, page 10.) This estimate does not include the overhead expense associated with the provision of floor space for the computer installation.

The costs of machine rental and floor space are included in the operating costs of the recommended network that were summarized in Chapter IV.

Initial system design is estimated to require nine man years over a three year period (minimum elapsed time is estimated at two and one-half years). Initial programming is estimated at eight man years over a two year period. Since programming and system design overlap, the estimated elapsed time for both is three years.

It is assumed that after the initial design and programming are completed, the computer-system would be tested first for one of the systems and then phased into each of the other two systems. This testing period would take about one year. A total of four years is thus required before a complete operating network can be achieved. The cost of computer-system design and programming is estimated at $300,000 over this four year period. (For further details, see Appendix C, page 8.)

While these capital costs appear to be quite acceptable for the operating advantages to be achieved it should also be borne in mind that other substantial non-EDP expenses will be incurred in the course of implementation. Probably the largest of these items will be the cost of the time of librarians and catalogers engaged in the exacting task of reaching full agreement on cataloging practices and rules and providing assistance to the EDP system designers. It is estimated that this cost may total as much as $100,000 over the implementation period.

Thus it is estimated that for an investment in implementation of some $850,000, annual operating savings of about $425,000 will be realized.

GUIDELINES

Inasmuch as four years of work will be required to make the recommended network fully operative after agreement is reached on going forward, it becomes urgent to give attention to the following matters:

1. Organization structure;
2. Location;
3. Cost-sharing; and,
4. Network capacity.

Each of these issues is discussed below.

Organization Structure. The proposed tri-system processing network should be organized under the direct control of the three public libraries. The administrative staffs of the cataloging-acquisition center and the preparation centers should be responsible to a joint committee consisting of the directors of the three library systems or their chosen representatives.

Location. The cataloging-acquisition center should be located within New York City to assure access to the library and EDP professional manpower pool upon which it will have to depend. It could be located on site with one of the three systems' preparation centers, but this is not essential and has not, in fact, been assumed in the cost estimates contained in this report. Locating the cataloging-acquisition center alongside one of the three preparation centers might, however, constitute the first stage in the eventual centralization of preparation operations. Such combined centralization of cataloging-acquisition and preparation would result in substantial improvements in efficiency and is desirable so long as it does not entail prohibitive expenditures for adequate space, or locate the preparation center in an area where efficient shipping and receiving is endangered.

Cost-Sharing. It will be necessary for the three libraries to reach agreement on a formula for sharing the operating costs of the cataloging-acquisition center. Since the adequacy of any cost-sharing formula that is devised will have to depend on evaluations of the results obtained through its use, a preliminary guideline is offered for sharing the costs of the first year of the center's operation.

It would appear to be desirable to support the first year of operation with a fund established for the purpose by equal contributions from each of the libraries. At the end of the year, total operating costs would be charged to the libraries on the basis of the proportions of unique title cataloging incurred during the year for each of the systems— singly and for two of the three libraries. These charges will be applied against the contributions to the operating fund and debits and credits made to each library. In the second year of operation, contributions to the operating fund would be proportionate to the charges developed for the preceding year.

Network Capacity. The growth in the systems' processing activities is discussed in detail in Appendix A. Those findings should provide adequate guidelines, in conjunction with the systems' plans for new branch development, for determining the capacity requirements that should be built into the components of the network to provide for the post-centralization processing needs of the three libraries.

It does not appear desirable for the three systems to plan to undertake processing activities for non-public libraries in New York City until the system is satisfactorily providing for public library requirements.

Research conducted among the schools and colleges of New York City during the course of the survey revealed that, although there is substantial interest and enthusiasm within these groups for such undertakings, there are many significant issues that would have to be resolved. It does not seem likely that the three systems could adequately negotiate these issues or even specify the precise services they are prepared to offer other institutions until the city-wide network is fully operative.

2

APPENDIXES

TECHNICAL PROCESSING OPERATIONS IN THE PUBLIC LIBRARIES OF NEW YORK CITY

The three public libraries included in the study are large, urban multi-branch systems. Table A-1 shows the book stock and phonorecord stock of each of the systems as of December 1964.[1]

Table A-1

BOOK AND PHONORECORD HOLDINGS OF THREE NEW YORK CITY LIBRARY SYSTEMS

System	Book Stock	Adult Non-Fiction Books	Books Held At Central Library	Phonorecord Stock
Brooklyn Public Library	2,869,429	1,456,936	819,679	41,359
New York Public Library	3,128,639	1,442,471	—	72,264
Queens Borough Public Library	1,985,019	1,060,105	362,025	18,317

Tables A-2a and A-2b on the following page summarize some features of the technical processing operations of the three systems.

Each of the systems has a centralized technical processing staff performing functions relating to the acquisition, cataloging, preparation and delivery of library materials for all the branches, central divisions and special outlets, such as hospitals and prisons, of the system. In the course of the survey, these system technical processing operations were studied in detail. Interviews were conducted with the heads of each technical processing department or unit, descriptions

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[1] All statistics in this appendix for the New York Public Library refer exclusively to its Circulation Department.

Table A-2

GENERAL CHARACTERISTICS OF CENTRALIZED PROCESSING OPERATIONS PUBLIC LIBRARY SYSTEMS, NEW YORK CITY

Table A-2a

System	Year Established	Branches July 1965	Units Using System For Over 75% Total Processing July 1965	
			Members	Non-Members
Brooklyn Public Library	1948	55	55	0
New York Public Library	1940	86	81	0
Queens Borough Public Library	1915	56	56	0

Table A-2b

System	Technical Processing Optimum Capacity July 1965		Factors Limiting Output July 1965	Place of Bottlenecks July 1965
	Cataloging (Titles)	Pre- and Post-cataloging (Items)		
Brooklyn Public Library	At capacity now		Manpower	Cataloging
New York Public Library	At capacity now		Space	Cataloging
Queens Borough Public Library	At capacity now		Manpower	Cataloging

of tasks were obtained, and the working procedures in each stage of the technical processing cycle were observed. Samples of forms used at one point or another in the cycle were collected, files and records were examined, and available statistical reports were analyzed. Raw data were collected from technical processing staff time sheets and work load reports, from inventory requisitions and equipment requests and from invoices. Certain data on various aspects of system processing operations that were collected in the course of the companion survey[1] were also utilized in this investigation.

The elements of the technical processing cycle vary from system to system. Functions considered the responsibility of the cataloging department in one system, for example, may be performed by the preparation department in one or both of the other systems. Thus it was necessary, after the data on output and costs had been collected for each system, to "shift" some activities and their related costs to conform to the definitions of the components of the processing cycle that were established for purposes of analysis. (These definitions were reviewed in Chapter I of this report.)

The remainder of this appendix consists of a review of historical and current technical processing output volumes, a description of the methodology of the cost analysis employed in this survey and a presentation of the current cost of technical processing activities in the three systems, an examination of the future volume of technical processing activities in the systems, and finally, a discussion of the variations in system cataloging practices. Since a comparative analysis of the three libraries' technical processing activities was not the concern of this study, the data that follows have been disguised.

VOLUME OF TECHNICAL PROCESSING OPERATIONS

Table A-3 summarizes acquisition, cataloging and preparation statistics from Program II of the Departmental Quarterly Performance Reports submitted by each of the libraries to the Bureau of the Budget of the City of New York for the five fiscal years up to and including 1964-65.

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[1] Centralized Processing for the Public Libraries of New York State, Nelson Associates, Inc., for the New York State Library, 1966.

Table A-3

TECHNICAL PROCESSING WORK LOAD
PUBLIC LIBRARY SYSTEMS, NEW YORK CITY
1960-61 —1964-65

Activity	System	1960-61	1961-62	1962-63	1963-64	1964-65
Purchase Orders Processed	A	102, 697	81, 541	80, 186	102, 539	102, 642
	B	64, 164	65, 561	61, 318	50, 540	65, 967
	C	72, 888	98, 987	98, 170	101, 823	92, 526
	Total	239, 749	246, 089	239, 674	254, 902	261, 135
Titles Cataloged	A	15, 783	14, 983	14, 221	17, 095	17, 818
	B	13, 494	15, 277	14, 445	17, 880	18, 429
	C	16, 361	20, 408	23, 080	25, 963	27, 364
	Total	45, 638	50, 668	51, 746	60, 938	63, 611
Items Prepared	A	500, 532	406, 562	362, 388	390, 004	405, 577
	B	238, 487	266, 483	293, 766	267, 320	243, 375
	C	431, 760	463, 443	340, 272	366, 275	355, 926
	Total	1, 170, 779	1, 136, 488	996, 426	1, 023, 599	1, 004, 878

The activities reported on in the table exhibit the following rates of growth in work load over the five year period: purchase orders processed—+8.9%; titles cataloged—+39.4%; items prepared— -14.2%. It should be emphasized, however, that these rates do not necessarily reflect true changes in the total activity level of the three libraries combined since there have been some changes in the interpretation of the scope of these activities as reported in the Performance Reports since 1960-61. Nonetheless, for purposes of projecting technical processing activities for the three systems combined, it appears reasonable to assume that the total number of items prepared annually by the libraries will tend to be relatively stable in the immediate future, that the number of purchase orders processed will increase gradually, and that the combined number of titles cataloged each year will grow at an average rate of between five and ten percent per annum.

Reference to the annual reports and internal records of the various technical processing units in each library permitted a more detailed analysis of the levels of processing operations during 1964-65 than the Performance Reports provide for. Table A-4 shows the 1964-65 work loads[1] for seven processing activities—the first two relating to acquisition, the next four to cataloging and catalog production, and the last to preparation—in terms of a common set of definitions established for these activities for purposes of analysis. The most significant of these definitions are given below:

> Items received: a count of items unpacked, including volumes, issues of periodicals and serials, pamphlets, phonograph records, college catalogs, music scores, and micromaterials (rolls of film, boxes or packages of print and card).
>
> Purchase orders processed: a count of purchase orders for books, periodicals, serials, pamphlets, phonograph records, college catalogs, music scores, micromaterials, personal orders placed by staff, and gift books sold to staff.

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[1] The figures in Table A-4 do not in all cases agree with those shown in Table A-3 for 1964-65. These differences are the result of several adjustments necessitated by either minor errors in the Performance Reports or slightly altered definitions for the activity being measured.

Table A-4

TECHNICAL PROCESSING WORK LOAD
PUBLIC LIBRARY SYSTEMS, NEW YORK CITY
1964-65

Activity	Material	System A	System B	System C	City-wide Total
Items Received	Book	353,197	253,442	—	—
	Non-book	88,326	46,554	—	—
	Total	441,523	299,996	503,005[a]	1,244,524
Purchase Orders Processed	Book	71,741	n. a.	75,958	—
	Non-book	20,785	n. a.	16,070	—
	Total	92,526	65,967	92,028	250,521
New Title Search	All	32,067	19,225	17,818	69,110
Duplicate Title Search	All	42,842	28,786	41,413[a]	113,041
Titles Cataloged	Book	24,689	18,067	16,396	59,152
	Non-book	2,371	362	1,422	4,155
	Total	27,060	18,429	17,818	63,307
Catalog Cards Produced	All	1,032,946	1,083,231	1,000,000[b]	3,116,177
Items Prepared	Book	n. a.	241,630	389,743	—
	Non-book	n. a.	1,745	16,726	—
	Total	355,926	243,375	406,469	1,005,770

a Projected
b Estimated

Titles cataloged: a count of any book, periodical, serial, pamphlet, phonograph record, music score, microfilm, microprint, microcard or film which falls into one of the following categories:

(1) New to system;
(2) New edition (title already in system);
(3) New to adult (title already in juvenile collection);
(4) New to juvenile (title already in adult collection);
(5) Recatalog (title already in system);
(6) Translation (title already in system).

Items prepared: a count of all books, micromaterials, phonorecords and albums prepared for circulation.

Table A-4 also shows the relationship of book to non-book materials for four of the processing activities listed. These figures indicate that books represented from 80 to 85% of items received, 78 to 83% of purchase orders processed, 91 to 98% of titles cataloged, and 96 to 99% of items prepared in the three systems during 1964-65. Thus, as one might expect, the bulk of non-book material enters the processing cycle in acquisition and leaves the cycle when acquisition is complete. No more than 5 to 10% of the annual work loads of the cataloging and preparation components of the processing cycle consists of non-book material.

The seven activities reported on in Table A-4 represent the major work loads of the acquisition-cataloging-preparation cycle. Nevertheless, the table does not accurately reflect the myriad of functions performed in technical processing. Some of these functions are subsumed under one or another of the broad activities shown in the table, others are by-products of the activities listed, while a third class of functions constitutes work loads not shown in Table A-4. Examples of the first category of functions would include: the number of items received that arrived automatically; the number of orders traced and cancelled; the number of card sets assembled; the number of labels, book cards and book pockets produced; and, the number of books jacketed. Examples of the second category of functions include: the number of items received that were reviewed by library staff, and the number approved for ordering; the number of items returned to vendors; and, the number of cards filed in official, public, division and branch catalogs.

The third category would include such functions as: gifts, transfers and withdrawals processed; catalog cards withdrawn; the number of holdings changes made in official catalogs; and, the number of items delivered.

Tri-system work loads for many of these processing cycle functions are not available, either because the revelant statistics are not maintained by all three systems or because the counts that are made in each system are incompatible. The latter condition is a natural consequence of the different processing procedures that are followed by the three libraries. For several of the functions cited above, however, reasonably complete data do exist. These, together with some additional characteristics of processing operations relevant to the question of further centralization, are reviewed below.

The acquisition units of the three processing staffs place orders with as many as 2,000 to 3,000 different publishers and jobbers. Two of the systems deal predominantly with publishers. The libraries maintain on-approval service with from 100 to 200 different publishers (including the Greenaway Plan publishers). Any one system may receive as many as 15,000 titles (books) a year automatically—either as automatic on-approvals, Greenaway Plan or as publishers' gifts. In one of the systems, about ten percent of books received automatically are approved for ordering by branches. The three libraries process a combined total of approximately 50,000 titles (books)—including system overlap—for book selection each year. One of the libraries reports that over 18,000 titles were processed for book selection in 1964-65. It appears that from 10 to 15% of adult titles processed for book selection are approved for ordering by branches and/or central divisions. Somewhat less than 50% as a maximum, of the books processed for book selection are distributed to system staff for review.

The library reporting the highest number of purchase orders processed traces between 15 and 20% of its orders. This system reports about the same percentage range for the number of orders cancelled (out-of-print, out-of-stock, etc.). A very small percentage—about two percent—of total book volumes received are returned to vendors. It appears that about one-fourth of those that are returned were originally sent on approval.

The three libraries combined processed some 60,000 to 65,000 gifts in 1964-65. More than half of these gifts were non-book library materials.

Of new titles cataloged, one system reports that 17% consisted of foreign titles and a second system reports that 22% were foreign titles. Phonorecords represented from 2 to 7% of new titles cataloged by the systems in 1964-65. Recataloging represents about 1 to 2% of the total annual cataloging work load in each system. The cataloging and/or recataloging of juvenile titles constituted from 3 to 10% of each system's total cataloging effort in 1964-65. The cataloging work load by month for each of the systems and the combined distribution are shown in Table A-5.

The cataloging department staffs in the three system assembled approximately 575,000 catalog card sets in 1964-65. These staffs added over 523,000 cards to the union, public, and divisional catalogs and union shelf list; they withdrew over 40,000 cards from these catalogs and the union shelf list, and, recorded some 345,000 branch discards on the holdings cards in their official catalogs.

COST OF TECHNICAL PROCESSING OPERATIONS

Three major cost elements formed the basis of the data collection and analysis aimed at estimating the 1964-65 total cost of technical processing operations in the city library systems. These three factors were the cost of labor, overhead costs and the cost of supplies. A breakdown of the items included in each of these elements is given below:

LABOR COST

- Salaries
- Retirement and Social Security Expenditures

OVERHEAD

- Floor Space
- Depreciation of Furniture and Equipment
- Support Services
    - Payroll
    - Accounting
    - Cleaning and Maintenance
    - Telephone
    - Electricity

Table A-5

TITLES CATALOGED
WORK LOAD BY MONTH
1964-65

Month	System A	System B	System C	Total	Rank	Percent
July	1,511	1,035	1,949	4,495	1	7.07
August	1,482	1,496	2,143	5,121	6	8.05
September	1,302	1,391	1,889	4,582	2	7.20
October	1,584	1,439	2,646	5,669	9	8.91
November	1,514	1,196	2,095	4,805	4	7.55
December	1,202	1,591	2,663	5,456	8	8.58
January	1,429	1,490	2,437	5,356	7	8.42
February	1,025	1,673	2,131	4,829	5	7.59
March	1,688	1,884	2,850	6,422	12	10.10
April	1,658	1,870	2,572	6,100	11	9.59
May	1,470	1,623	1,586	4,679	3	7.36
June	1,953	1,741	2,403	6,097	10	9.58
Totals	17,818	18,429	27,364*	63,611*		100.00

* Unadjusted for 304 added editions included in count.

Heat
Purchasing and Storeroom
Printing and Cutting of Office Forms
General Service Contracts and Rentals

SUPPLIES

General Office Supplies
Technical Processing Supplies
Equipment Supplies

Each of these cost factors was developed, to the extent applicable, for the acquisition, cataloging and preparation units in each system. Whenever percentage charges were employed, such as for the value of the libraries' expenditures for employee social security and retirment fund,they were obtained from the appropriate administrative office in each library. The use of floor space was costed at $2.75 per square foot, unless actual rental expenses were being incurred for such use. Furniture and equipment was depreciated over ten years. The costs of administrative and general support services were constructed with the assistance of the several administrative units and prorated to the technical processing departments on the basis of either work load ratios, employee, floor space or equipment ratios. Accounting charges include the cost of handling vendor accounts payable and branch budget encumbering whenever these functions were being performed by the accounting department staff. Supply costs were established by applying current unit costs to totals of items requisitioned from the systems' supply storerooms or purchased direct during 1964-65.

The determination of supply costs had to be based on amounts bought or requisitioned rather than on amounts actually used since records of the latter are not maintained by the three processing staffs. In order to avoid gross under- or overstatements in the annual cost of particular supplies, the more significant supply items were reviewed with technical processing personnel in each library to ascertain whether or not the quantities being costed provided reasonable estimates of the quantities used during the year.

The calculation of depreciation charges for furniture and equipment used by the libraries' technical processing staffs was based on 1964-65 replacement costs whenever historical costs for an item were unavailable. These current replacement costs were provided by the purchasing offices in each system. Furthermore, since data on purchase dates for items of equipment and furniture were very incomplete, all such items used to support technical processing activities during 1964-65 were costed and depreciated on a straight-line ten year schedule.

Charges for administrative supervision beyond the level of the chief of technical processing were not prorated over the processing units in the cost analysis developed for this study. Except for the reinforcing of new material, binding and processing for rebinding expenditures were likewise excluded from the analysis. Finally, the costs of acquisition, cataloging and/or preparation activities performed within the system but outside the realm of the central technical processing offices are not part of the cost estimates developed in this survey.

Delivery costs included the cost of labor, equipment depreciation (a 7.5 year schedule was used), maintenance of vehicles, garage rental, supplies (gas and oil), and insurance. Total delivery costs in each system for 1964-65 were charged to technical processing on the basis of the ratio of new items delivered to total items handled by the truck fleet during the year.

The costs of card filing and withdrawing performed by library staff other than the technical processing personnel were estimated by applying a unit filing-withdrawing cost (found to have prevailed during 1964-65 in one of the systems' cataloging departments[1]) to the total number of cards added and withdrawn by such staff.

Table A-6 presents the total estimated cost for technical processing operations performed by the three systems during 1964-65. It is estimated that it cost the three libraries nearly $1,950,000 in fiscal 1964-65 on the five component activities of the technical processing cycle. Of this, slightly more than 40% is accounted for by cataloging and catalog production. Furthermore, cataloging and catalog production and maintenance account for nearly 55% of tri-system annual costs for technical processing. It should be re-emphasized that the total city-wide cost for the acquisition function, for example, is not necessarily equal to the total operating costs of the three system

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[1] One system maintained statistics on catalog maintenance by the cataloging department staff in sufficient detail to permit the construction of a unit cost for that activity. From these statistics and the data generated in the cost analysis it was estimated that it costs this particular system $.0609 per card for catalog maintenance of the official, public and division catalogs and of the union shelf list and authority file. This unit cost was used to estimate branch catalog maintenance costs in the three library systems.

Table A-6

TOTAL COST OF TECHNICAL PROCESSING OPERATIONS PUBLIC LIBRARY SYSTEMS, NEW YORK CITY 1964-65

Component of Technical Processing Cycle	Tri-System Costs	Percent Total Cost
Acquisition	$ 450,585	23.2
Cataloging and Catalog Production	820,557	42.1
Preparation	412,943	21.2
Delivery	19,404	1.0
Catalog Maintenance*	243,065	12.5
Total	$1,946,554	100.0

* Represents the cost of additions to and withdrawals from all card catalogs and shelf lists that are not maintained by the systems' cataloging department staffs.

acquisition departments because of the "shifts" that had to be made once the department costs per se were established to construct the function costs according to the definitions established for the components of the processing cycle.

As Table A-6 indicates, the analysis conducted in this study resulted in an estimate of some $1,680,000 as the cost for acquisition, cataloging and catalog production, and preparation in 1964-65. Of this total, 68% is accounted for by the direct labor costs of those processing units in the three libraries, and 79% represents the total labor costs (direct labor cost plus library social security and retirement fund expenditures) of those system processing units.

Table A-7 shows for the three New York City systems their respective average costs per item for each of the major processing components except catalog maintenance.

FUTURE VOLUME OF TECHNICAL PROCESSING OPERATIONS

The review of historical volumes of technical processing operations in the three systems indicated that the combined number of purchase orders processed tends to exhibit a small annual increase, the combined number of titles cataloged tends to expand at an average annual rate of between five and ten percent, and that the combined number of items prepared tends to be relatively stable in the short run.

The number of new branches that each system opens has an effect on the individual and combined level of technical processing operations. All three libraries have plans for significant system expansion, so that it appears reasonable to expect that the three systems will, in the immediate future, continue to exhibit at least these same rates of growth in processing work loads.

CATALOGING PRACTICES

Table A-8 below summarizes the cataloging classification scheme(s) used by each of the New York City library systems for various categories of materials cataloged.

Table A-7

PROCESSING COSTS PER ITEM
NEW YORK CITY PUBLIC LIBRARY SYSTEMS
1964-65
(Cost in Dollars)

System	To Receive Item[a]	To Catalog Item[b]	To Prepare Item[c]	To Deliver Item[d]	To Process Item[e]
A	.354	.638	.369	.014	1.459
B	.438	1.443	.352	.030	2.365
C	.324	.596	.482	.017	1.497

[a] Total acquisition costs divided by items received.
[b] Total cataloging costs divided by items prepared.
[c] Total preparation costs divided by items prepared.
[d] Total delivery costs divided by items prepared.
[e] Total costs divided by items prepared.

Table A-8

CHARACTERISTICS OF CATALOGING PRACTICES PUBLIC LIBRARY SYSTEMS, NEW YORK CITY July 1965

System	Library Material	Classification Scheme	Subject Heading Scheme
Brooklyn Public Library	Adult	Dewey— 15th edition	LC cutter numbers
	Juvenile	Dewey— abridged 8th edition	Combination of several schemes
	Phonorecords	Library's own scheme	—
New York Public Library	Adult	Dewey— 14th edition (but some in 16th edition and some in 11th edition)	LC no cutter numbers
	Juvenile	Dewey— abridged 8th edition	Combination of several schemes
	Phonorecords	Library's own scheme	—
Queens Borough Public Library	Adult	Dewey— 14th edition (but some in 16th edition)	LC cutter numbers
	Juvenile	Dewey— abridged 8th edition	Library's scheme based mainly on Wilson
	Phonorecords	Library's own scheme	—

Part I

CATALOGING OVERLAP

In Program II of the Departmental Quarterly Performance Reports to the City of New York covering processing activities during the fiscal year 1964-65, the city's three public library systems reported a combined total of 63,307 titles cataloged.[1]

Although each system reports only the total of unduplicated titles that have been cataloged during the year, the 63,307 total does not represent the actual number of different titles cataloged for the public libraries in New York City in 1964-65, since some portion of the titles entering the count at any one system would also have been cataloged and counted by one or both of the other systems during the year. Furthermore, even when same-period duplicates have been eliminated from the combined total reported, the unduplicated total still overstates the amount of cataloging that would have to be done in a one year period by a center cataloging for the public libraries in New York City. This is due to the fact that some portion of the titles cataloged by any one system during 1964-65 would have been cataloged by some other system prior to 1964-65. In an established centralized cataloging facility, such titles would not have to be cataloged twice since they would fall into the category of added copy titles.

In order to estimate the actual number of unique titles that would have to be cataloged for the three systems combined, the following sampling procedure was designed and implemented: random samples of titles cataloged were taken from the 1964-65 catalogers' work sheet files[2] at two of the three systems; one of these samples was searched in the official catalogs of the two other systems to determine the percent of titles in the sample that had not been cataloged by either of these two during 1964-65 and the percent of titles in the sample that had never been cataloged by the two systems;[1] the second sample was searched only in the official catalog of the non-sampled system to determine the percent of sample titles that had not been cataloged by this system during 1964-65 and the percent of sample titles that had never been cataloged by the system; the percentages ascertained were applied to the titles cataloged statistics as reported by each of the systems to establish estimates of, first, the actual number of different titles cataloged by the three systems in 1964-65 and second, the number of these different titles that were cataloged for the first time by any of the public libraries in New York City during 1964-65.

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[1] The actual combined total reported was 63,611. This figure has been reduced by 304 to eliminate a specialized statistic entering the count of one system that was not included in the titles cataloged count of the other two systems.

[2] These files contain a work sheet for each title cataloged by the system. Although there is some lag between the time a title is actually cataloged and the time at which the work sheet enters the file, it was believed that these lags would not seriously distort the results of the sampling procedure.

Part II of this appendix explains the rationale behind the sampling procedure that was employed and indicates how a sufficient sample size was determined. In Part III of the appendix, Table B-1 presents the results of the sample look-ups. The remainder of that section demonstrates the manner in which these results were used to arrive at the desired estimates and level of precision.

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[1] The approximate date on which a title was cataloged is almost always available on either the main entry or shelf-list card.

Part II

SAMPLING PROCEDURE

The current overlap in the combined total of 63, 307 titles cataloged by the three systems in 1964-65 can be visualized as in Figure B-1, where each circle represents the total titles cataloged at each system and where the areas of intersection of the circles represent the several situations in which a particular title was cataloged by two (AB, AC, BC) or all three (ABC) of the city systems during the year.

In Figure B-1, the combined total of 63, 307 titles cataloged is represented by the area

$$A + B + C + 2(AB) + 2(AC) + 2(BC) + 3(ABC).$$

The actual number of different titles cataloged by the three systems is represented by the area given by

$$A + B + C + AB + AC + BC + ABC.$$

Grouping terms, this can be written as

$$(A + AB + AC + ABC) + (B) + (C + BC),$$

where

(A + AB + AC + ABC) = the total area (titles cataloged) of Circle 1 — the non-sampled system

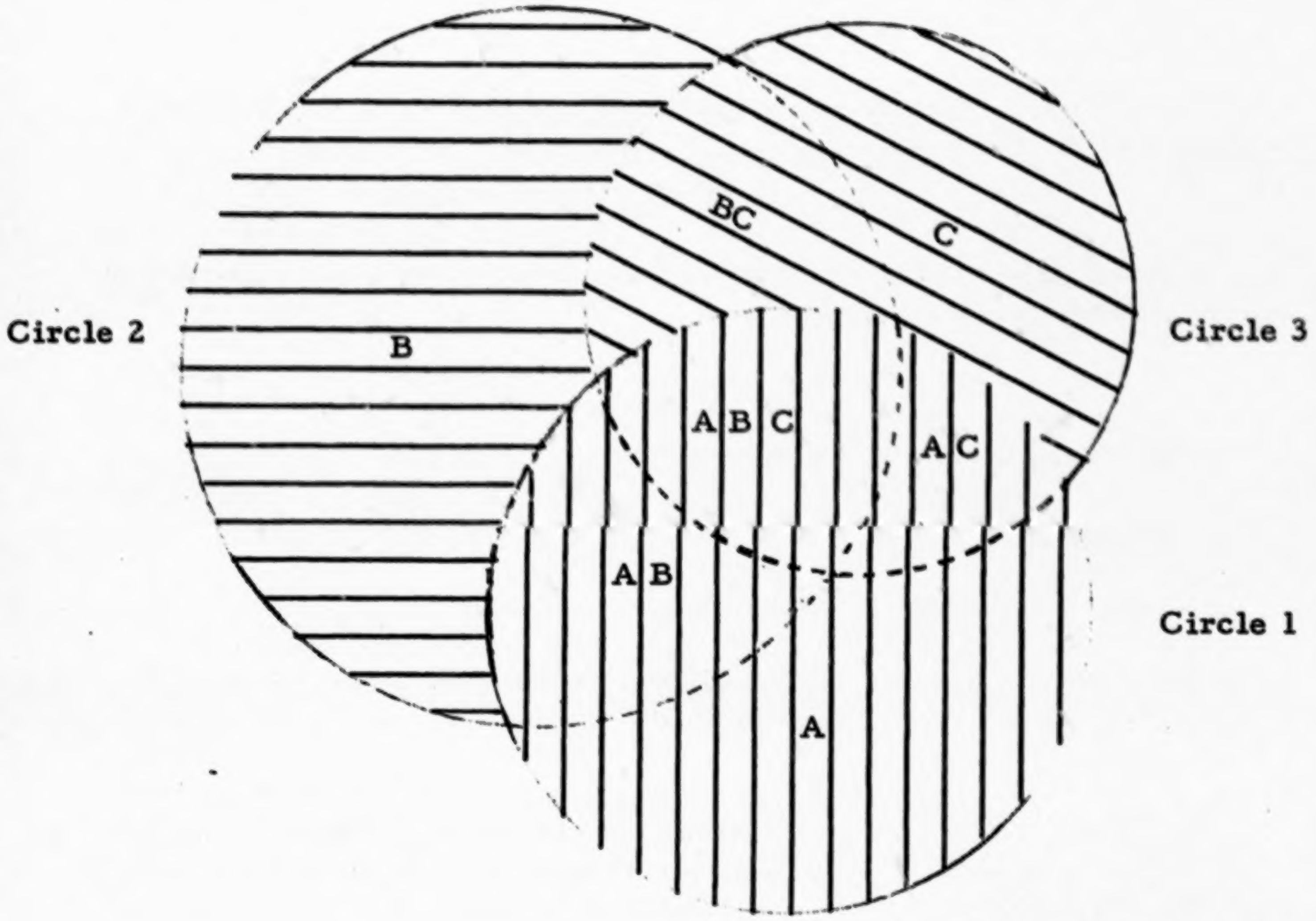
(B) = the unduplicated area (titles) of Circle 2 — the system whose sample is searched at each of the other systems

and

(C + BC) = the area (titles) of Circle 3 — the system whose sample is searched only at the non-sampled system — that is not duplicated by Circle 1.

Figure B-1

THREE SYSTEMS' CATALOGING OVERLAP


BC
C
Circle 2
B
Circle 3
A B C
A C
A B
Circle 1
A

Since the total area of Circle 1 (the number of titles cataloged as reported by the non-sampled system) was known, the sampling procedure was designed to quantify the areas (titles cataloged) defined by (B) and (C + BC). In accordance with the above descriptions of these areas, the number of titles represented by (B) was estimated by applying the percent of titles unmatched-in-same-period [1] in the sample searched at the official catalogs of the two other systems to the total titles cataloged in 1964-65 by the system at which the sample was taken. The number of titles represented by (C + BC) was estimated by applying the percent of titles unmatched-in-same-period in the sample searched in the official catalog of the non-sampled system to the total titles cataloged in 1964-65 by the system at which this second sample was taken.

The results of these calculations (presented in Part III), along with the unmatched percentage statistics, were used to estimate the number of different titles cataloged by the three library systems in 1964-65 and to determine the precision of this estimate at a given confidence level.

As Part I indicated, searching the samples in the systems' official catalogs provided a second set of percentages which was to be used to estimate the number of titles, among the different titles cataloged during the year, that had never before been cataloged by any of the city systems. The attempt here was to eliminate from the total of different titles cataloged those titles that would fall into the category of added copy titles if the systems' cataloging were centralized. Thus, this second estimate, arrived at by applying the percent of titles in each sample that had never been cataloged to the respective titles cataloged statistics for 1964-65, would indicate the actual number of unique titles that would have to be cataloged by an established center cataloging for the three systems combined.

Size — Use of a Random Sample. The sample size required to attain a specified precision in the estimate of different titles among the 63,307 reported was determined in accordance with accepted statistical methods. For a confidence level of 95%, the size of the sample required to provide reliability of ± 6% in the results of the sampling procedure employed was found to be 150. That is, selecting random samples of 150 catalog work sheets, we would be 95% certain that the "true" number of different titles among the 63, 307 was ± 6% of the estimate resulting from the sampling procedure. To select the random samples, the work sheet files were broken into one-inch sections and each section was numbered, beginning with files for July 1964 and ending with those for June 1965. Work sheets for the two system samples were selected from within these marked sections using numbers from a published random list.[1]

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[1] In determining same-period matches or unmatches, a time span of six months was employed. Titles cataloged more than six months apart were not considered to have been cataloged in the same period.

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[1] Griffin, John I., Statistics: Methods and Applications, Holt, Rinehart & Winston, New York, 1962, p. 465.

Part III

SAMPLING RESULTS

Table B-1 summarizes the results of the samplings that formed the basis of the calculations underlying the estimate of the number of different titles, among the 63,307, cataloged by the three systems in 1964-65.

Table B-1

SAMPLING TO DETERMINE NEW YORK CITY SYSTEMS' CATALOGING OVERLAP

	Same Period Match		Same Period No Match		Prior Period Match		No Match		Total Titles	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sample #1 (searched in two union catalogs)	73	48.67	77	51.33	13	8.66	64	42.67	150	100.0
Sample #2 (searched in one union catalog)	56	37.33	94	62.67	9	6.00	85	56.67	150	100.0

As the table indicates, 51.33% of the titles in the sample searched at the official catalogs of the two other systems had either not been cataloged during the same period or had never been cataloged by these two systems. Similarly, 62.67% of the sample titles searched at the official catalog of the non-sampled system had not been duplicated by the non-sampled system in 1964-65. These results were applied to the formula for the estimate of the number of different titles cataloged, as given below

$$E(U) = A + (.5133)B + (.6267)C$$

where A, B and C represent the titles cataloged in 1964-65 by the non-sampled system, the system whose sample was searched twice, and the system whose sample was searched once, respectively. Accordingly,

$$E(U) = 17818 + (.5133)(27060) + (.6267)(18429)$$

$$E(U) = 43,257.$$

Thus, out of the 63,307 titles cataloged, it is estimated that 43,257 were different titles. This estimate has a precision of ± 2,645, or about ±6% at the 95% confidence level.

In order to estimate the number of titles among the 43,257 that had never been cataloged before in any of the systems in New York City, it was necessary to take into account the prior-period matches resulting from the two sample look-ups. These look-ups revealed that 8.66% of the sample searched twice had been cataloged in a prior period and that 6% of the sample searched once had been cataloged in a prior period. Since the non-sampled system's cataloging in 1964-65 would also have included titles cataloged in a prior period by one or the other of the two sampled systems, it was necessary to estimate the extent of this prior period overlap. Based on the results of the sample look-ups, it was estimated that 9.33% of the non-sampled system's 1964-65 cataloging contained prior-period matches with the other two systems. Adding these percentages to the formula for E(U) gave:

$$E(U) = (.9067)A + (.4267)B + (.5667)C$$

$$E(U) = (.9067)(17818) + (.4267)(27060) + (.6267)(18429)$$

$$E(U) = 38,147.$$

It is estimated that 38,147 titles had never before been cataloged by the three public libraries.

Since the large majority of the prior-period matches reflected system time lags of less than five years in the cataloging of a title and most exhibited lags of about three years, a center cataloging for the New York City library systems would experience a decline in the titles it had to catalog for these systems from an estimated initial annual level of some 43,000 titles to an estimated level of 38,000 titles. This decline would be virtually complete after five years of centralized cataloging. On the basis of these findings, it appeared reasonable to use 40,000 titles as the yearly cataloging capacity required in an established centralized center cataloging for the three New York City systems.

PROJECTED COSTS OF THE RECOMMENDED PLAN

Appendix A contains the results of research conducted for this study concerning the current technical processing operations of the three public library systems in New York City. This appendix discusses the operating costs and associated capital investments estimated for the recommended plan for further centralization of those processing activities. The plan itself is discussed in Chapters II - V of the report. The bases for the cost estimates made for the proposed book catalog are discussed in Part II of Appendix F.

OPERATING COSTS

The operating cost estimates for each of the five processing components—acquisition, cataloging, preparation, delivery, and catalog production and maintenance—[1] are dealt with separately below. Primarily because the electronic data equipment which would be used in the recommended plan would affect each of the processing elements differently, the estimated costs for the various elements have been developed in different ways. All estimates include allowances for expected personnel and overhead expenses.

Table C-6 at the end of this section summarizes these cost figures and compares them to the current costs for technical processing in the libraries.

Acquisitions

The recommended plan would substantially change the acquisitions function. The change most affecting the estimation of costs for the recommended acquisition procedure is the heavy employment in it of EDP equipment. Since the recommended procedure is substantially different from any of the present operations, the estimate for this element has been built from a series of estimates made for the various activities which will be performed in the acquisition element. These estimates and the total arrived at are shown in Table C-1.

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[1] In this appendix, catalog production is costed with catalog maintenance for purposes of comparison, and not with cataloging, as it was in Appendix A.

Table C-1

ESTIMATE FOR RECOMMENDED ACQUISITION ELEMENT

Function or Expense	Annual Cost
Machine costs	
Rental	$ 51,000
Supporting personnel and other expenses	66,000
Sub-total machine costs	$117,000
Other costs	
Receiving and mailing	$ 20,000
Assembly of preparation materials	135,000
Order searching	25,000
Reproducing and collating lists	10,000
Order follow-up	20,000
General administration	60,000
Sub-total other costs	$270,000
Total all acquisition costs	$385,000*

* Figure rounded to nearest $5,000.

Cataloging

In the recommended plan this element would also make use of EDP equipment. It would use the one installation of equipment which would also be serving the acquisition element and producing catalog materials. (In estimating the machine costs for the activities making substantial use of the EDP equipment—acquisitions, cataloging and catalog production—the total estimated machine costs for the one installation have been divided among the activities on the basis of the proportion of the total machine effort which it is expected each activity will require.)

The estimate of "Other costs" in Table C-2 is based upon the number of professional cataloging personnel believed to be needed to catalog 40,000 titles in a year. The assumption has been made that Library of Congress copy will be available for about 56% of the titles by the time they are cataloged at the center and that the cataloging output of the Library of Congress will be available on machine readable tape.

Table C-2

ESTIMATE FOR RECOMMENDED CATALOGING ELEMENT

Function or Expense	Annual Cost
Machine costs	
Rental	$ 32,000
Supporting personnel and other expenses	46,000
Sub-total machine costs	$ 78,000
Other costs	
Head cataloger, salary and benefits	$ 20,000
Catalogers, salary and benefits	100,000
Supporting personnel, salary and benefits	75,000
General administration	70,000
Contingencies	10,000
Sub-total other costs	$275,000
Total all cataloging costs	$350,000*

* Figure rounded to nearest $10,000.

Preparation

The estimate for this element is based upon the present system preparation costs (excluding all assembly costs) and on allowance for the increased complexities of communication between the cataloging-acquisition center and the three preparation centers. In addition, an estimate for receiving and shelving of ordered materials has been included since the responsibility for this task will shift from the acquisition departments to the preparation centers.

No allowance for EDP operations has been included in the estimates for this element because the use of EDP equipment is minimal in this case when compared with the use of such equipment in the acquisition and cataloging elements. Table C-3 sets out the estimates for the preparation and delivery element.

Table C-3

ESTIMATE FOR RECOMMENDED PREPARATION ELEMENT

Function or Expense	Annual Cost
Present preparation activities (excluding assembly)	$280,000
Communication with center	35,000
Receiving and shelving	110,000
Total	$425,000

Delivery

The estimate shown in Table C-4 for the delivery element in the recommended system assumes that the New York City systems will continue to deliver prepared items as at present.

Table C-4

ESTIMATE FOR RECOMMENDED DELIVERY ELEMENT

Function or Expense	Annual Cost
Present delivery activity	$20,000
Contingencies	5,000
Total	$25,000

Catalog Production and Maintenance

The table below presents the estimated costs for the production of the book catalog and shelf-list cards and the maintenance of shelf lists under the recommended plan. The catalog production costs for the recommended plan are the total of two estimates: the one made of the production cost of book catalogs (aside from machine time) discussed in Part II of Appendix F, and the other for the machine time required for the production of shelf-list cards and book catalogs under the proposed arrangements.

Table C-5

ESTIMATE FOR RECOMMENDED CATALOG PRODUCTION AND MAINTENANCE ELEMENT

Function or Expense	Annual Cost
Catalog production	$270,000
Catalog maintenance	60,000
Total	$330,000

Comparative Overall Costs

Table C-6 compares the operating costs of current technical processing operations in the three libraries with the costs of operating the proposed network. The costs of the recommended plan are listed twice: in the first column in the table, the costs of the recommended plan are grouped according to the manner in which the network would actually operate; while, in the second column, these costs are shifted slightly to make the component costs in the recommended plan comparable to the component costs under the present processing arrangements.

Table C-6

COSTS: PRESENT ARRANGEMENTS AND RECOMMENDED PLAN

Processing Components	Recommended (as it would operate)	Recommended (arranged for comparison)	Present	Saving: Recommended (compared) Over Present
Processing Elements				
Acquisition	$ 385,000	$ 360,000	$ 450,000	$ + 90,000
Cataloging	350,000	350,000	660,000	+ 310,000
Preparation	425,000	450,000	410,000	- 40,000
Delivery	25,000	25,000	20,000	- 5,000
Sub-total processing elements	$1,185,000	$1,185,000	$1,540,000	$ + 355,000
Catalog Production and Maintenance				
Book catalog production	$ 270,000	$ 270,000	—	$ - 270,000
Card catalog production	—	—	$ 160,000	+ 160,000
Catalog maintenance	60,000	60,000	240,000	+ 180,000
Sub-total catalog production and maintenance	$ 330,000	$ 330,000	$ 400,000	$ + 70,000
Total all components	$1,515,000	$1,515,000	$1,940,000	$ + 425,000

CAPITAL INVESTMENT

In addition to the annual operating costs of the proposed network, the recommended plan entails certain one-time costs. It appears that the largest of these will be the system design costs, the costs associated with the creation of the tri-system union card catalog for the cataloging acquisition center, and the data processing installation costs. These are summarized in the table below.

Table C-7

ESTIMATED CAPITAL COSTS OF PROPOSED NETWORK

Activity	Cost	
Creation of tri-system union card catalog		$300,000
System design		
EDP personnel professional effort	$300,000	
Library personnel professional effort	100,000	400,000
Equipment installation		150,000
Total		$850,000

Tri-System Union Card Catalog Costs

The tri-system union card catalog that will serve as the "official" catalog of the cataloging-acquisition center insofar as material acquired prior to centralization is concerned, will be generated during the period of system design by reproducing and inter-filing the main entry (and holdings) cards in the three libraries' official catalogs. This tri-system catalog will then be edited according to the rules of entry established for the cataloging center to assure that all main entries for a particular title are filed together.

There are four major cost components in the creation of tri-system union. The estimates for each component are shown in Table C-8.

These estimates are based on the assumption that there are approximately 900,000 main entry cards (not counting duplicate main entries marked for reference) in the three systems' official catalogs.

Table C-8

TRI-SYSTEM UNION CARD CATALOG COSTS

Expense	Cost
Reproduction of main entry and holdings card (1,800,000 cards @ $.05)	$ 90,000
Filing cost (includes initial withdrawal and eventual refiling in official catalogs, and inter-filing to create tri-system union card catalog) (2,450,000 cards @ $.06)	150,000*
Editing	50,000
Provision for card catalog cabinets	10,000
Total	$300,000

* Figure rounded to nearest $10,000.

System Design Costs

There are two elements in these costs: those for the EDP personnel who would be involved and those for the personnel of the libraries who would have to assist in the development of the systems. The costs for the EDP personnel can be estimated fairly closely; on the basis of available information, those for the library personnel are only rough approximations.

It is expected that it would require about four years, from the start of system design, to establish an operating computer-based network for the three public libraries. Of that time, the first three years would be spent on system design and programming, while the last year would be used to test the computer-system for one library and phase in the two remaining libraries. Varying EDP personnel requirements will have to be met during these two periods. Table C-9 outlines these personnel needs and estimates their cost.

Table C-9

FOUR-YEAR SYSTEM DESIGN AND PROGRAMMING COSTS

Expense	Cost
First period	
3 system designers for 3 years ($12, 000/year)	$108, 000
4 programmers for 2 years ($10, 000/year)	80, 000
Overhead allowance (30% of personnel cost)	56, 000
Sub-total first period	$244, 000
Second period	
2 system designers for 1 year ($12, 000/year)	$ 24, 000
2 programmers for 1 year ($10, 000/year)	20, 000
Overhead allowance (30% of personnel cost)	13, 000
Sub-total second period	$ 57, 000
Total both periods	$300, 000*

* Figure rounded to nearest $10, 000.

In the designing of the computer-system, there will probably be an extensive collaboration between professional library personnel from the three libraries and the EDP programming staff. It seems likely that a committee or series of committees of library personnel will be formed to work with the EDP personnel. It also seems reasonable that the expenses of such committees should be considered part of the capital investment necessary for the network. It is possible that some library personnel may have to be assigned full time or give substantial parts of their working hours on a regular basis to the organizing of the network; if this is the case, it would also seem reasonable to consider the salaries of such personnel as a capital expense. It is hard to estimate what the total costs for the library personnel involved would be. A rough estimate of $100,000 has been made, half of it for salaries and half for expenses of the various individuals and committees. It is believed that this amount would be ample for the purpose.

Equipment Installation Costs

Table C-10 shows the total costs incurred by an organization which recently made an installation similar to the one proposed in this report.

Table C-10

ELECTRONIC DATA EQUIPMENT
INSTALLATION COSTS
(Illustrative)

Expense	Cost
Heating, ventilating, air-conditioning Raised floor Electricity	$ 91,600
Partitions General conditions Structural ceilings, fire protection, etc. Engineering Construction supervisor	51,400
Total installation costs	$143,000
Figure rounded upward for estimating purposes	$150,000

HISTORICAL CARD CATALOG CONVERSION

Chapter II of this report discusses the limited conversion of active titles from the systems' pre-centralization collections that is recommended as an effective device for improving the value of the book catalog in the several years immediately following its adoption and for hastening the benefits of computerized acquisition by increasing the number of frequently re-ordered titles that can be ordered by a unique item number. Public service personnel in the three libraries expressed the belief that such a scheme would virtually eliminate the necessity for an immediate post-centralization conversion of the historical card catalogs in each system to book catalog form. This does not necessarily mean, however, that a complete conversion of the historical card catalogs will never be necessary or desirable.

This appendix briefly discusses three alternative techniques for historical card catalog conversion and provides estimates of the costs for accomplishing each of the alternatives. The estimates are based on the assumption that there are 900,000 titles in the three official card catalogs and that of these 900,000 approximately 62% are unique titles. The following ten functions and cost factors formed the basis for these estimates:

1. Labor cost of editing;
2. Labor cost of keypunching;
3. Labor cost of proofreading;
4. Overhead (10% of #1 - 3);
5. Fringe benefits (19% of #1 - 4);
6. Filming and plate making;
7. Offset printing and binding;
8. Supplies;
9. Computer time; and,
10. Administration and catalog conversion planning.

Independent Conversion of Systems' Catalogs

In the first alternative for conversion of the systems' historical card catalogs, each catalog is converted independently of the other two. Thus the overlap in titles held by the systems as part of their pre-centralization collections does not affect the conversion effort. Each of the 900,000 main entry cards must be edited, keypunched, proofed and eventually printed in a book catalog. This scheme results in three separate system union book catalogs as replacements for the respective system's historical card catalogs. The cost of this conversion alternative has been estimated at $950,000.[1]

Combined Conversion of Systems' Card Catalogs

The critical difference between schemes based on a combined conversion effort and the independent conversion alternative discussed above relates to the overlap of titles in the libraries' historical collections. Only a combined conversion effort can take advantage of the overlap that exists to effect reductions in the cost of conversion. Two methods of implementing a combined conversion are discussed below. Both methods achieve economies because of the overlap in titles, but the total cost of the second scheme is considerably greater than the cost of an independent conversion for reasons that will be evident in its description.

Method One. This combined conversion results in a tri-system union book catalog of the pre-centralization collections. Each entry in the book catalog contains a system holdings symbol to identify which of the three systems holds the title, as well as the call number under which the title is shelved in each system holding it. This approach is identical to the one proposed in Chapter II for a select list of frequently re-ordered titles. Here it is extended to include the entirety of the historical collections. It is estimated that such a conversion would cost about $800,000.[1]

Method Two. This approach to the conversion of the official card catalogs to book catalog form parallels the method above with one major exception. This scheme results in a tri-system union book catalog that shows only one call number for each entry in the book catalog. This is achieved by editing the two or three systems' duplicate main entry cards to one classification number. This, in effect, entails reclassification of all titles held by more than one system to select the "best" of the two or three classification numbers. This alternative, involving as it does the re-numbering of book spines and book cards on all copies of a title held in a system whose assigned class number for that title is altered during editing, is estimated to cost $1,950,000.[1]

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[1] This estimate is based on the assumption that the official tri-system union card catalog would provide the basis for the conversion effort.

Part I

COMPUTER-SYSTEM FLOW CHART

This textual material explains Charts E-1 and E-2 which follow it.

The computer-system can best be described by dividing the functions into four major categories:

1. Input, transcribe and sort;
2. Update, output and sort;
3. Catalog; and,
4. Process and list.

INPUT, TRANSCRIBE AND SORT

Daily, the proper input from the libraries is keypunched and read into the computer during Run-1. Errors are checked and flagged, and two magnetic tapes are generated. One will contain all new items for which there is no Library of Congress card number nor catalog copy, and the other will have transcribed the rest of the paper input.

The new items without LC information are entered into Run-4 where they are merged with the LC copy file—bibliographic information received periodically from LC—and sorted to author, title and publisher sequence. The tape is then matched, in Run-5, against the cumulative file of LC copy and entries on the computer-system for which no LC number nor copy has been provided. Daily, an updated new items file is produced containing all the titles split off during Run-1, with the relevant LC number and copy added to the items, plus any selected LC copy that meets the prescribed criteria for entry to the computer-system's item master file.

This new information is merged with the previously transcribed input and is sorted in Run-2 to item number, the unique classification for all titles in the computer-system.

Input to Sort Run-2

1. New title notices;
2. Replacement list notices;

3. Completed catalog work sheets;
4. Orders from system headquarters and branches—multiple, special, and cancellation;
5. Completed receiving cards;
6. Completed branch shipment cards; withdrawal notices from branches;
7. Completed invoicing work sheets;
8. Debit and credit to supplier notices;
9. Invoice notices;
10. Validated voucher cards;
11. Library payment cards;
12. Special information requests;
13. Label, and shelf-list card requests;
14. File changes—branch, supplier, authority, item master; and,
15. Supplier assignment notices.

To these 15 notices from the libraries' departments or agencies must be added:

16. File of LC updated new titles and selected LC copy from Run-5;
17. All changed item numbers and cross references from old item numbers—split off the basic output file in Run-6; and,
18. Errors discovered in catalog information when matched against the authority file in Run-7 (these notices cause the associated heading to be flagged on the item master file until corrections are made by the catalog department).

Inputs 1-15 enter the computer via punched cards. The majority of these are keypunched at the cataloging-acquisition center from completed source documents prepared by the libraries' staffs. However, several of these inputs are punched by the computer during a previous run and may need no keypunching at all, or may only need to be updated before re-entry. Other inputs are keypunched from work sheets partially prepared by the computer and completed by various staff units in the systems and the center.

Inputs prepunched by computer:

1. Multiple order cards: inserted in all automatic copies sent to the systems' headquarters for selection and "passing";

returned to the center where selection-rejection code and branch orders are keypunched;

2. Receiving cards: forwarded to the receiving units at the preparation centers for each order-number/title combination; returned to the center when the items ordered have been received from the supplier;

3. Branch shipment cards: a duplicate of the multiple order or special order card forwarded to the shipping units at the preparation centers; returned to the cataloging-acquisition center when the items have been delivered to the ordering branch or branches;

4. Payment voucher cards: sent to central accounting department for verification; used as input to generated checks to suppliers;

5. Library payment cards: sent to the systems' headquarters with bills returned to the center with payment check.

Work sheets prepared by computer:

1. Catalog work sheets: prepared for each title to be cataloged and containing all cataloging information available in the machine record for the title; completed by searchers and/or catalogers and keypunched for re-entry;

2. Invoicing work sheets: forwarded to central accounting department weekly for updating of open orders listed; keypunched weekly for re-entry.

UPDATE, OUTPUT AND SORT

The processing of the input records, updating of the item master file, and generating of the basic output file are all accomplished in Run-3.

During this run, the sorted basic input is matched against the item master file which is updated and rewritten. For every input, the program generates a corresponding output record, except for the following:

1. New Title—no record is written to the basic output file; the title is added to the item master file;

2. Orders—one output record for each title/branch requested;

3. Cataloging—the necessary tracings are written to the basic output as separate records, at an average ratio of four output records for each item, plus one record for the union shelf-list file;

4. Shipment—duplicate output record, one to be used to update holdings, and the other for processing information;

5. There will be one output record for every title on the item master file that is in active status. This is estimated to be approximately 33% of the item master file.

Every record on the basic output file will have a heading containing the sorting number and criteria for the particular record. The file will be entered into Run-6 where each type of record will be sorted by its number and criteria, and three tapes will be produced. The file with all changed item numbers and cross references will be re-entered in Run-2 for item master file updating; the file containing cataloging and holdings information and errors will be passed on to Run-7 for the first steps in catalog production; and the file with ordering, preparing, and processing information is entered into Run-10 for the processing and listing runs.

CATALOG

Run-7 accepts the split output tape containing catalog and holdings information, authority file changes and errors, and matches this file against the authority master. All errors are flagged, the authority file is updated, the month-to-day supplement catalog is updated with new catalog and holdings information, and an error file, proof copy of new cataloging, and cumulative authority file changes are written to an output tape. In Run-8, daily, this file is sorted to proofreading sequence, errors are consolidated, and the tape is split so that all errors found in Run-7 during authority matching can be re-entered into Run-2 for item master file flagging. The proof copy and error file are printed daily in Run-9 to produce for the cataloging staff:

1. Proof copy for cataloging;
2. Error list; and,
3. Month-to-day cumulative authority file changes.

Once a month, the month-to-day supplement and holdings file are entered into Run-15 where the year-to-month supplement file is updated and the monthly supplement catalog is printed. It undergoes reduction, platemaking, printing and binding for use by public and staff. Run-15 also produces the following for use by the cataloging staff:

1. Union shelf list by classification number;
2. Holdings information by title;
3. Authority file listing; and,
4. Cataloging statistics.

Every 15 months in Run-18, the year-to-month supplement file is run against the previous year's main catalog, and a new main catalog and union shelf list are produced.

There are two more listings associated with new titles that must be mentioned.

1. Monthly, out of Run-14, central staff receives a listing, by title, of all LC received, but not inserted on the item master file, and a list of titles currently on the master file for which no LC copy has been received. This information will serve a twofold purpose. First, any spelling changes in author, title, etc., which might have caused a no-match during Run-5 can be found and re-entered into the computer correctly. Second, these listings are used for visual search for LC copy for those classes of items on which it is felt that the likelihood of ordering is not high enough for automatic entry of LC copy onto the item master file.

2. Every three months in Run-14, a list of titles which have been on the item master file for a prescribed period of time without receiving LC copy will be prepared.

PROCESS AND LIST

The sorted split output tape from Run-6, daily, which contains non-catalog information is saved and merged twice weekly for entry into Run-10 which further splits the file into two tapes, one containing billing and budget information and the other, items associated with ordering and suppliers. Run-10 also prints book labels and shelf-list cards for the receiving units at the three preparation centers; the status report describing the ordering, cataloging, and preparation action taken on all active items on the master file; selection, not-recommended, and new title "no action" lists; and, the catalog work sheets which are re-entered in Run-1.

The split order file, sequenced by supplier and branch, is read into Run-11 twice weekly to update the supplier master file with all current ordering, receiving, and invoicing information. Run-11 produces the following listings and card outputs:

1. Receiving cards and branch shipment cards (to the receiving units at the three preparation centers);
2. Error listing (to the acquistion unit and central accounting department for correction)
3. Orders to supplier (to the acquisition unit for verification);
4. Completed orders report (one copy to the acquisition unit, the central accounting department, and the receiving units at the preparation centers);
5. Payment voucher cards (to the central accounting department);
6. Return to supplier notices (to the acquisition unit and receiving units at the preparation centers);
7. File change audit register (to the acquisition unit);
8. Miscellaneous debit and credit register (to the central accounting department);
9. Checks (to suppliers); and,
10. Check register (to the central accounting department).

Run-11 also generates an order file containing all orders and all debits and credits to suppliers that have not yet been processed. This tape is sorted twice weekly in Run-12—orders are sequenced by supplier and title, and debits and credits by account number. Run-13 prints the sorted tape and produces the following listings:

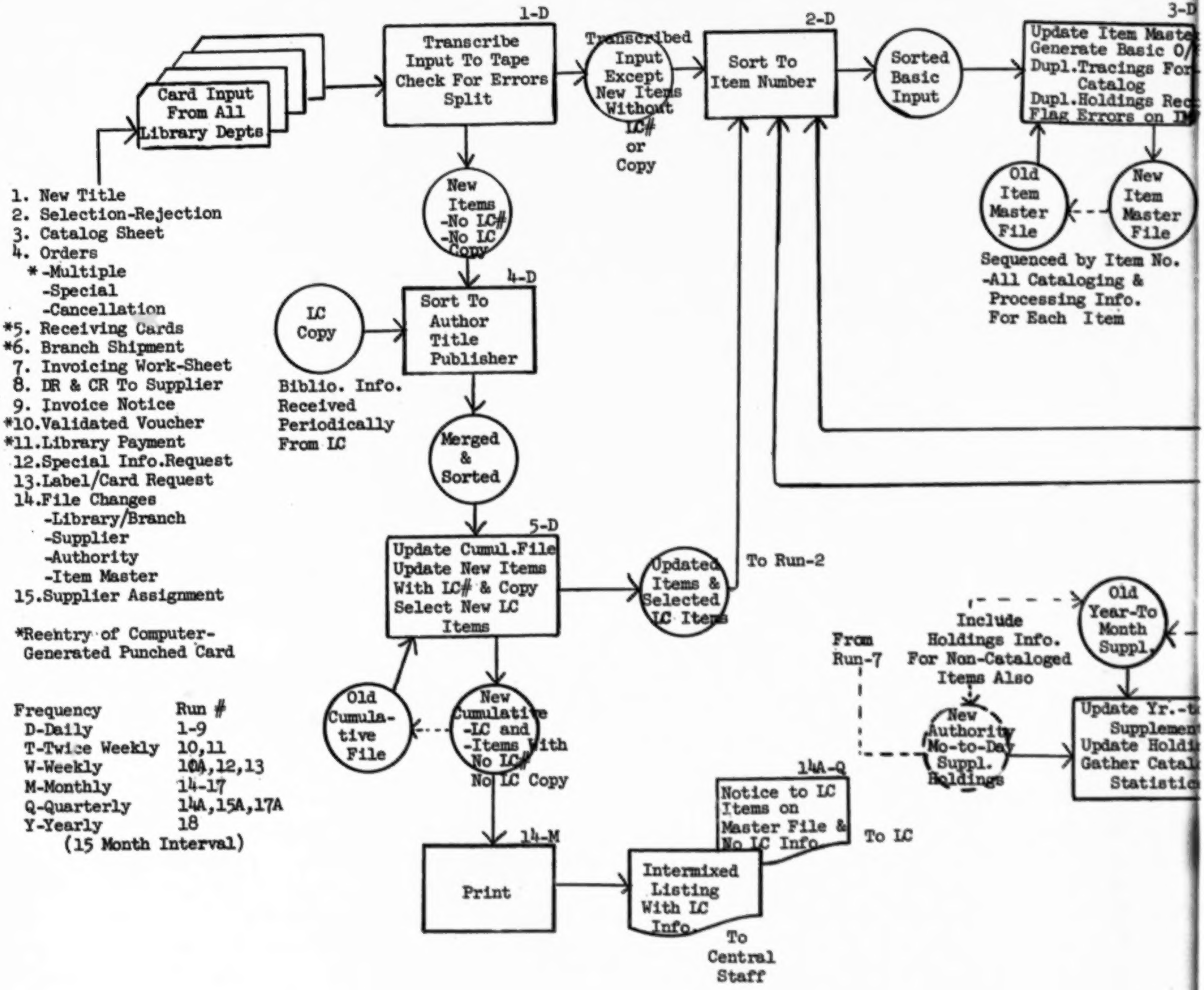
1. Accounts to charge and credit (for entry into the general ledger);
2. Overdue orders report (to the acquisition unit for verification and notice to suppliers); and,
3. Invoicing work sheets (to the central accounting department where the order number, quantity, and amounts are transcribed and re-entered into Run-1).

The split bills and budget file is saved and merged monthly to be entered into Run-17. The supplier master file is sorted monthly in Run-16 to library and branch code sequence and is used in conjunction with the bills and budget file to update the branch master file. All accounting information, orders, receipts, payments, budget by category where applicable, etc., are kept on the branch master and updated monthly. Run-17 produces the following reports:

1. Bills (to the library systems) and budget reports (to branches);
2. Statement and order confirmation (to libraries and branches);
3. Serials and books overdue at branches (to the center's staff for verification and notice to preparation centers or suppliers); and,
4. Subscription—serial renewals (to be re-entered into Run-1 as orders).

Chart E-1

INPUT TRANSCRIPTION, ITEM MASTER FI


Card Input From All Library Depts
1-D
Transcribe Input To Tape Check For Errors Split
Transcribed Input Except New Items Without LC# or Copy
2-D
Sort To Item Number
Sorted Basic Input
3-D
Update Item Maste
Generate Basic O/
Dupl.Tracings Fo
Catalog
Dupl.Holdings Re
Flag Errors on D
Old Item Master File
New Item Master File
Sequenced by Item No. -All Cataloging & Processing Info. For Each Item
New Items -No LC# -No LC Copy
4-D
LC Copy
Sort To Author Title Publisher
Biblio. Info. Received Periodically From LC
Merged & Sorted
5-D
Update Cumul.File Update New Items With LC# & Copy Select New LC Items
Updated Items & Selected LC Items
To Run-2
Old Cumulative File
New Cumulative -LC and -Items With No LC# No LC Copy
Old Year-To Month Suppl.
Include Holdings Info. For Non-Cataloged Items Also
From Run-7
New Authority No-to-Day Suppl. Holdings
Update Yr.-t
Supplemen
Update Holdi
Gather Catal
Statistic
14A-Q
Notice to LC Items on Master File & No LC Info
To LC
14-M
Print
Intermixed Listing With LC Info.
To Central Staff

1. New Title
2. Selection-Rejection
3. Catalog Sheet
4. Orders
   - *-Multiple
   - -Special
   - -Cancellation
*5. Receiving Cards
*6. Branch Shipment
7. Invoicing Work-Sheet
8. DR & CR To Supplier
9. Invoice Notice
*10. Validated Voucher
*11. Library Payment
12. Special Info.Request
13. Label/Card Request
14. File Changes
   - -Library/Branch
   - -Supplier
   - -Authority
   - -Item Master
15. Supplier Assignment

*Reentry of Computer-Generated Punched Card

Frequency	Run #
D-Daily	1-9
T-Twice Weekly	10,11
W-Weekly	10A,12,13
M-Monthly	14-17
Q-Quarterly	14A,15A,17A
Y-Yearly	18
(15 Month Interval)	

art E-1

STER FILE MAINTENANCE, CATALOGING

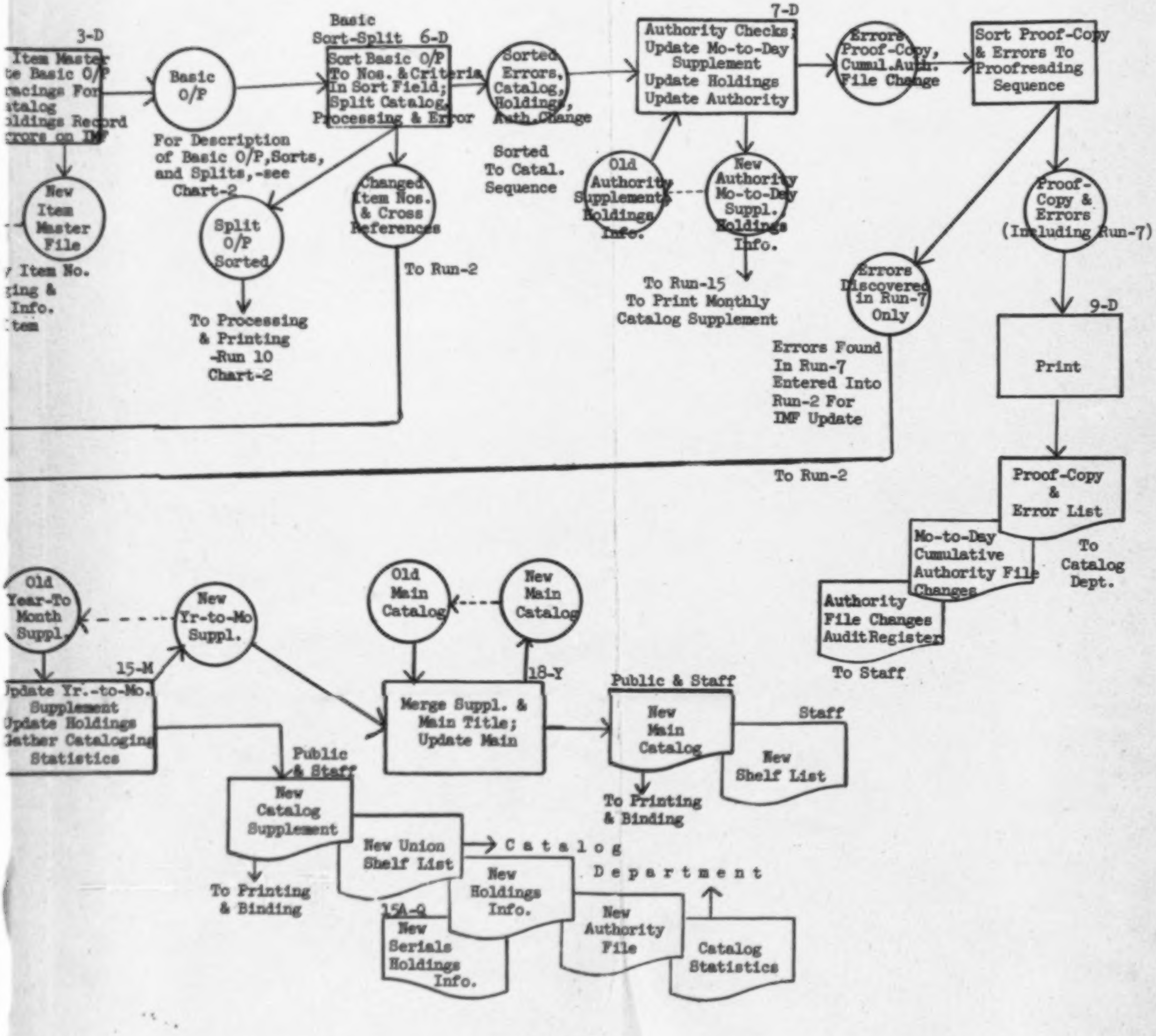
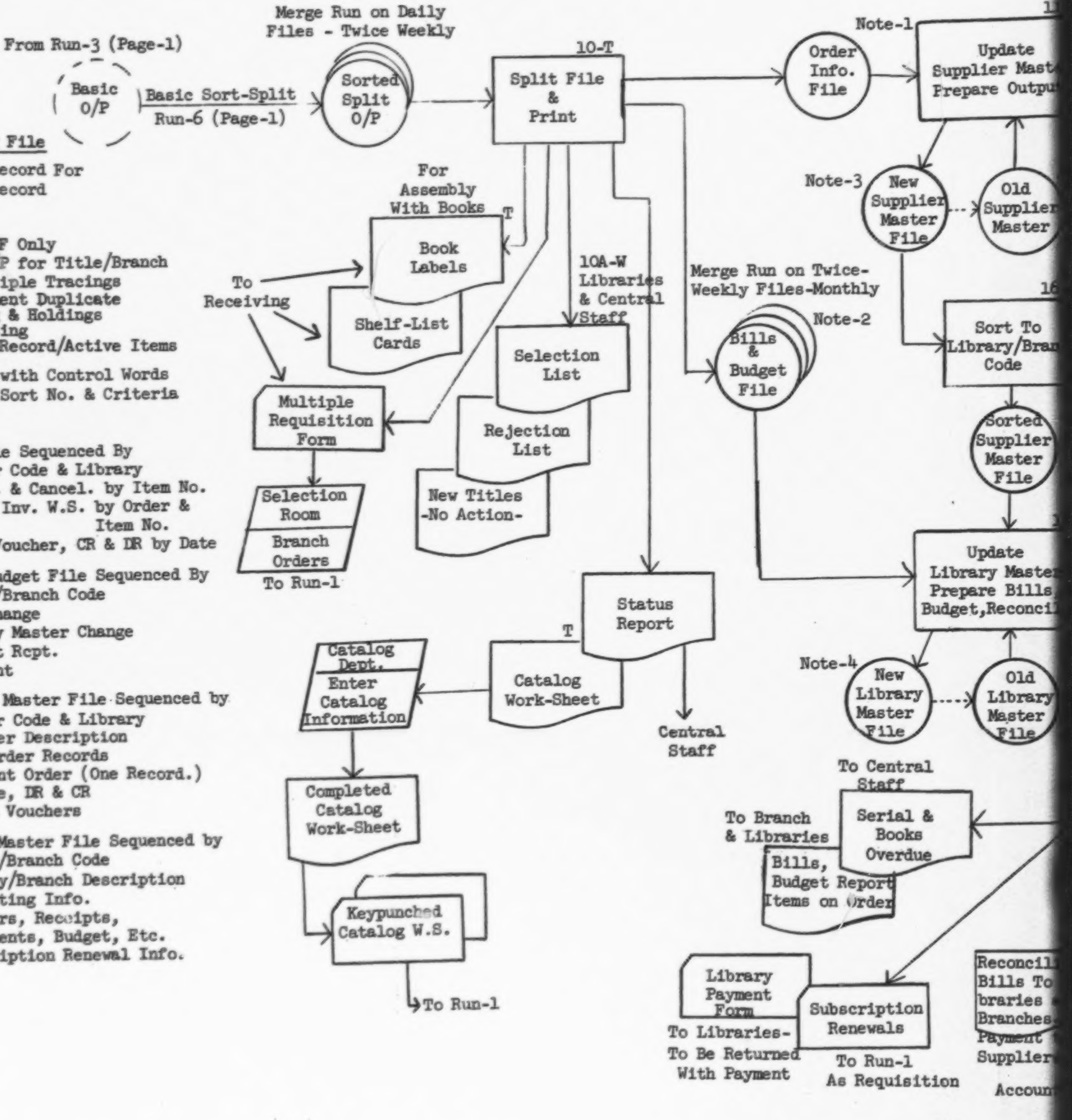

3-D
Item Master
te Basic O/P
racings For
atalog
oldings Record
rrors on IMF
New Item Master File
y Item No.
ging &
Info.
Item
Basic O/P
For Description of Basic O/P, Sorts, and Splits, -see Chart-2
Basic Sort-Split 6-D
Sort Basic O/P To Nos. & Criteria In Sort Field; Split Catalog, Processing & Error
Split O/P Sorted
To Processing & Printing -Run 10 Chart-2
Changed Item Nos. & Cross References
To Run-2
Sorted Errors, Catalog, Holdings, Auth. Change
Sorted To Catal. Sequence
7-D
Authority Checks; Update Mo-to-Day Supplement Update Holdings Update Authority
Old Authority Supplements Holdings Info.
New Authority Mo-to-Day Suppl. Holdings Info.
To Run-15 To Print Monthly Catalog Supplement
Errors Proof-Copy, Cumul. Auth. File Change
Sort Proof-Copy & Errors To Proofreading Sequence
Proof-Copy & Errors (Including Run-7)
Errors Discovered in Run-7 Only
Errors Found In Run-7 Entered Into Run-2 For IMF Update
To Run-2
9-D
Print
Proof-Copy & Error List
To Catalog Dept.
Mo-to-Day Cumulative Authority File Changes
Authority File Changes Audit Register
To Staff
Old Year-To Month Suppl.
New Yr-to-Mo Suppl.
15-M
Update Yr.-to-Mo. Supplement Update Holdings Gather Cataloging Statistics
Public & Staff
New Catalog Supplement
To Printing & Binding
New Union Shelf List
Catalog Department
15A-Q
New Serials Holdings Info.
New Holdings Info.
New Authority File
Catalog Statistics
Old Main Catalog
New Main Catalog
18-Y
Merge Suppl. & Main Title; Update Main
Public & Staff
New Main Catalog
Staff
New Shelf List
To Printing & Binding

Chart E-2

ORDERING, ACCOUNTING, PRO


From Run-3 (Page-1)
Basic O/P
Basic Sort-Split
Run-6 (Page-1)
Merge Run on Daily Files - Twice Weekly
Sorted Split O/P
10-T
Split File & Print
Order Info. File
Note-1
Update Supplier Mast
Prepare Outpu
Note-3
New Supplier Master File
Old Supplier Master
For Assembly With Books
T
Book Labels
To Receiving
Shelf-List Cards
10A-W Libraries & Central Staff
Selection List
Rejection List
New Titles -No Action-
Merge Run on Twice-Weekly Files-Monthly
Note-2
Bills & Budget File
Sort To Library/Bra Code
Sorted Supplier Master File
Multiple Requisition Form
Selection Room
Branch Orders
To Run-1
Status Report
T
Catalog Work-Sheet
Central Staff
Catalog Dept.
Enter Catalog Information
Completed Catalog Work-Sheet
Keypunched Catalog W.S.
To Run-1
Update Library Maste
Prepare Bills
Budget,Reconci
Note-4
New Library Master File
Old Library Master File
To Central Staff
Serial & Books Overdue
To Branch & Libraries
Bills, Budget Report Items on Order
Library Payment Form
To Libraries- To Be Returned With Payment
Subscription Renewals
To Run-1 As Requisition
Reconcili Bills To braries Branches Payment Supplier
Accoun

Basic O/P File

One Output Record For
Each Input Record
Except For:

New Title-IMF Only
Requis.-1 O/P for Title/Branch
Catalog-Multiple Tracings
Branch Shipment Duplicate
  1. Catalog & Holdings
  2. Processing
Plus Status Record/Active Items

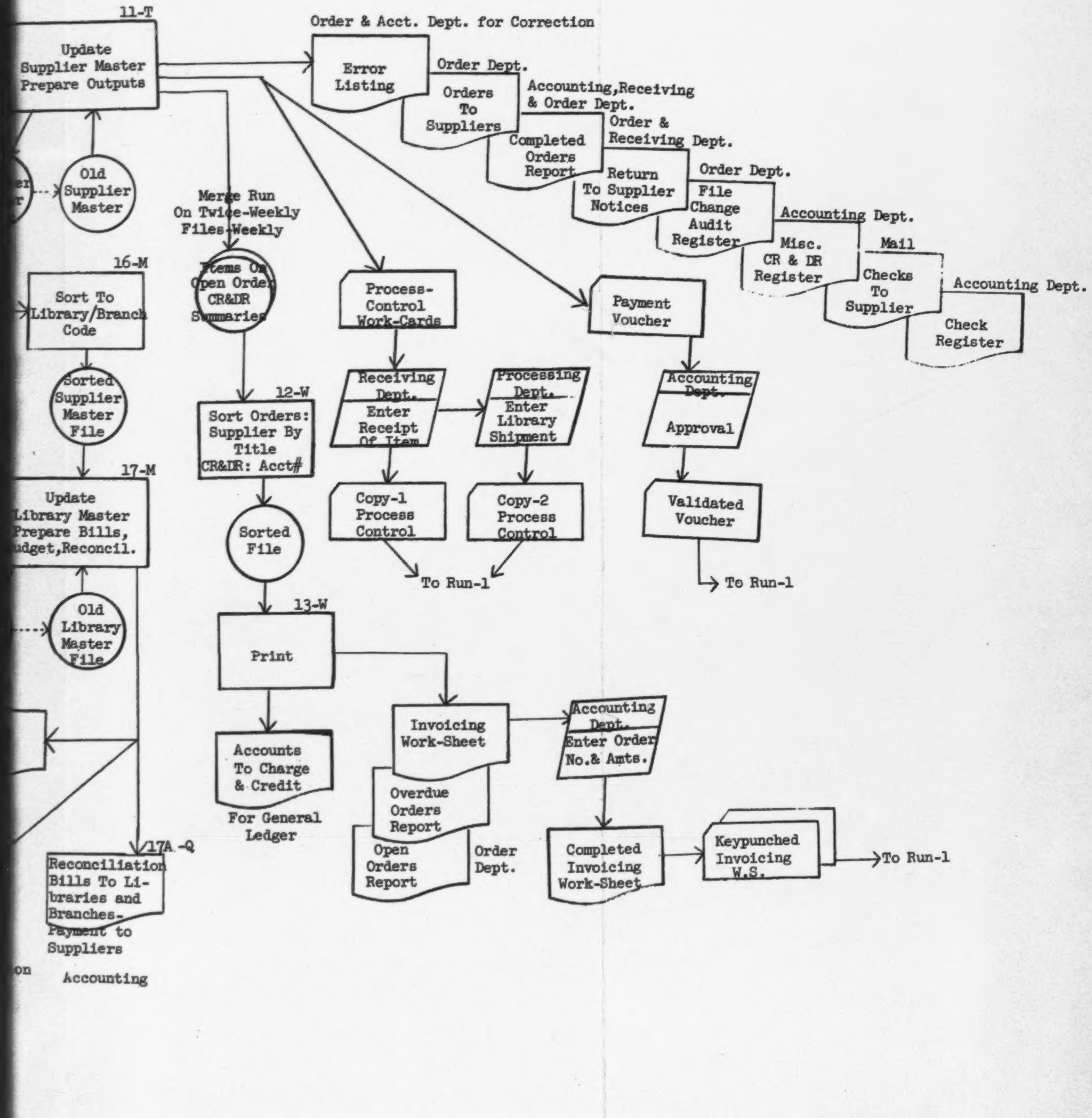
Each Record with Control Words
Containing Sort No. & Criteria

NOTES

1. Order File Sequenced By Supplier Code & Library
   - -Requis. & Cancel. by Item No.
   - -Rec. & Inv. W.S. by Order & Item No.
   - -Inv., Voucher, CR & DR by Date
2. Bill & Budget File Sequenced By Library/Branch Code
   - -Item Change
   - -Library Master Change
   - -Payment Rcpt.
   - -Shipment
3. Supplier Master File Sequenced by Supplier Code & Library
   - -Supplier Description
   - -Sent Order Records
   - -Not Sent Order (One Record.)
   - -Invoice, DR & CR
   - -Unpaid Vouchers
4. Library Master File Sequenced by Library/Branch Code
   - -Library/Branch Description
   - -Accounting Info.
     - -Orders, Receipts, Payments, Budget, Etc.
   - -Subscription Renewal Info.

hart E-2

ING, PROCESSING MATERIAL


11-T
Update Supplier Master Prepare Outputs
Order & Acct. Dept. for Correction
Error Listing
Order Dept.
Orders To Suppliers
Accounting, Receiving & Order Dept.
Completed Orders Report
Order & Receiving Dept.
Return To Supplier Notices
Order Dept.
File Change Audit Register
Accounting Dept.
Misc. CR & DR Register
Mail
Checks To Supplier
Accounting Dept.
Check Register
er
r
Old Supplier Master
Merge Run On Twice-Weekly Files-Weekly
16-M
Sort To Library/Branch Code
Items On Open Order CR&DR Summaries
Process-Control Work-Cards
Payment Voucher
Sorted Supplier Master File
12-W
Sort Orders: Supplier By Title CR&DR: Acct#
Receiving Dept. Enter Receipt Of Item
Processing Dept. Enter Library Shipment
Accounting Dept. Approval
17-M
Update Library Master Prepare Bills, udget, Reconcil.
Sorted File
Copy-1 Process Control
Copy-2 Process Control
Validated Voucher
To Run-1
To Run-1
Old Library Master File
13-W
Print
Invoicing Work-Sheet
Accounting Dept. Enter Order No. & Amts.
Accounts To Charge & Credit
For General Ledger
Overdue Orders Report
Open Orders Report
Order Dept.
Completed Invoicing Work-Sheet
Keypunched Invoicing W.S.
To Run-1
17A-Q
Reconciliation Bills To Libraries and Branches-Payment to Suppliers
on
Accounting

Part II

EQUIPMENT SPECIFICATIONS AND ALTERNATIVES

EQUIPMENT SPECIFICATIONS

Although the computer-system will handle a large volume of orders and catalog printing, a one-machine configuration appears to be sufficient for these volumes, even allowing for expected future increases. The equipment specifications are as follows:

one computer processing unit
two input-output channels
five magnetic tape units and control
one card reader
one line printer and cartridge adapter
one reader and printer control unit

The cost estimate for this equipment has been based upon units of the IBM-360 line of equipment. This is not to be construed as a specific recommendation for the use of these units. Similar equipment is available from a number of other manufacturers at comparable prices.

The computer-processing requirements appear to be low enough to be satisfied by a computer with the internal speed of the Model 30 in the IBM-360 line. For the volumes involved, 32,000 characters of core memory appear adequate and tape speeds of 30,000 characters per second (Model 1 tape units of the IBM-360 line) are sufficient. One printer with a rated speed of 1,100 lines per minute has been assumed (IBM-1403, Model 3). It is further assumed that a special interchangeable print chain cartridge with upper and lower case characters will be used for printing the catalog. This will cut the effective printer speed to about 500 lines per minute. The annual rental for equipment with the specifications outlined above is estimate at $100,000 (rounded to the nearest $5,000).

In addition to this computer configuration, the cataloging-acquisition center would require eight keypunch and verifying machines for the preparation of computer-input material. The total annual rental for these machines is estimated at $7,500.

INPUT-DEVICE ALTERNATIVES

The choice of an optimum input device actually remains unresolved and should be one of the first problems studied in further detail when a final system design is laid down. Punched card input has been assumed in this report because it is definitely feasible and does not necessitate assumptions about future advances in input equipment technology. Nonetheless, the following factors should be noted.

1. For input of cataloging information, punched paper tape would undoubtedly be the superior medium. However, the ordering portion of the computer-system requires considerable re-entry of computer-produced output. Paper tape input does not offer a convenient means of such re-entry.

2. In the system analyzed here, re-entered inputs, such as multiple orders and receiving reports, take the form of cards with item numbers pre-punched. The additional information on these inputs, i.e., number of copies ordered or received, would be written on the cards and later keypunched. The majority of this keypunching could theoretically be eliminated by employing some form of mark reader as an input device. The two types of mark readers currently available are electrographic mark sensing and optical mark reading. The optical reader appears to be more reliable and allows greater flexibility in the form of document and the density and placement of marks on the document. On the other hand, the optical mark readers presently available have rather slow reading rates.

3. An excellent input system that would avoid card punching could very likely be built around the combined use of a paper tape reader and an optical mark reader. Paper tape would be used for general and cataloging inputs, while the optical reader would be employed for the re-entry of computer-produced outputs.

USE OF RANDOM ACCESS COMPUTER STORAGE

There are several potential applications for random access storage in a computerized cataloging-acquisition operation such as the one proposed in this report. Utilization of a random access storage device, either in conjunction with or as a substitute for magnetic tape units, is not a prerequisite, however, for the achievement of an operationally sound computer-system. The use of random access equipment in a centralized cataloging-acquisition installation essentially involves the balancing of some improvement in operating procedures or the chance to introduce some dramatic innovation against significantly higher equipment costs. Some of the factors affecting this balancing are discussed below.

1. One application for random access would be for storage of the item master file. In the proposed computer-system, only items on which there has been some activity during several preceeding years are kept on the item master file. If a title is ordered that is no longer maintained on the file, it must be re-entered onto the file as new input. With random access storage the item master file could contain perhaps 20 years of items on which there has ever been any activity. Thus it would almost never be necessary to re-enter items onto the file. The technique would be to maintain separate files for the most recently active items and for older items. Titles would first be processed against the active file, and the file of older items would be searched only if the title had not been found in this active file. The active file might be maintained in a separate section of random access storage or, for a number of very good reasons, it might be kept on magnetic type. At present, however, it appears that a tape item master file can provide sufficient storage for the extent of re-ordering of older materials that occurs in the three libraries.

2. If the authority file were maintained in random access storage, post-cataloging authority checks could be made before the record was duplicated. All errors could be found at once and marked on the item master file. It would not be necessary to recirculate error records from the authority file check-run to the item master file run. Furthermore, such utilization of random access would eliminate the need for special programming to handle the situation in which one duplicate of a record is found to be in error on the authority file run, while other duplicates are passed. The random access requirements for this application are much less than those for the one discussed above. It may, therefore, be worthwhile to employ a small capacity random access storage unit for this purpose only.

3. Utilization of random access storage opens the possibility for on-line access to the files and direct computer interrogation. However, this in turn necessitates the rental of a more powerful computer as well as input-output consoles. Such equipment would considerably increase computer-system costs. Provision of such direct access might allow for sophisticated applications not possible with the proposed configuration, but such considerations are not part of the present study of centralized technical processing. If in the future applications requiring on-line access become desirable, there should be no difficulty in preparing programs to read the tape files into random access storage and orgainize them properly.

Part I

BOOK CATALOGS

COST OF BOOK CATALOG PRODUCTION

The costs involved in producing a book catalog were studied. The cost of computer maintenance of the catalog files is included in the overall computer system cost. The cost of catalog input preparation is included in the overall input preparation cost. The costs discussed here are the costs directly attributable to use of a book form of catalog. These are the costs for original printing on the computer printer and for photography, platemaking, offset printing, collating, and binding.

It was assumed that the master page would be computer-printed on 14x18 inch sheets and photo-reduced to 8 1/2x11 inch size. Direct printing of paper multilith masters on the computer printer was found to be uneconomical. If the computer-printing is done on 8 1/2x11 inch masters, there is no photo-reduction, there are many more pages, and the saving in platemaking cost would be more than offset by increased printing costs. If the computer-printing is done on large masters, it presents difficulties in printing on standard presses. In addition, it becomes impossible to achieve the economies of printing two or more pages at a time, which can be done on standard presses.

A constant volume catalog containing ten years of cataloging output was assumed. Costs are given for two periods. There is the buildup period in which the catalog is growing from no entries to ten years of cataloging output. There is the constant volume period in which, at each recumulation of the main catalog, old entries are deleted to compensate for new entries added. The following characteristics were assumed for the catalog:

1. Two column format;
2. Thirty full entries per age, 60 condensed entries;
3. For each item, on the average, one full main entry and three condensed added entries;
4. Monthly supplements; and,
5. Main catalog reprintings at the optimum intervals.

Results of these calculations for the proposed city-wide catalog, as well as three separate system catalogs, are set out in Table F-1.

Table F-1

ESTIMATE OF ALTERNATIVE BOOK CATALOG COSTS

[All Costs in Thousands of Dollars; Computer Print Time in One-Shift Weeks (40 Hours)]

			Buildup Period	Constant Volume Period			
Catalog Alternative	Thousand Titles Per Year	Copies Provided	1/10 of Total Reproduction Cost	Annual Reproduction Cost	Thousand Pages Per Year	Computer Print Time Per Year	Annual Computer Print Cost @ .25 Per Page
City-wide	40	800	$143	$206	54	6.7	$13
System A	27	250	64	92	36	4.5	9
System B	18	250	43	60	24	3.0	6
System C	18	300	47	67	24	3.0	6

Notes

Reproduction Cost: This includes photography, platemaking, printing, collating, and binding.

Buildup Period: The cost given is the total cost averaged over ten years. However, the cost is not uniformly distributed. It will be low at the outset and high in the last year. For example, the cost of the proposed city-wide catalog in the first year of the buildup period is estimated to be $55,000; the average annual cost during the first five years of the buildup period is $105,000; and the average annual cost during the last five years of the buildup period is $181,000.

Computer-Print Cost: This is shown to give some idea of the relationship to reproduction cost. It does not represent an added cost, since this computer time is included in the total operating cost for the computer installation.

CITY-WIDE BOOK CATALOG VARIATIONS

Table F-2 shows how the costs for the proposed city-wide catalog costed in Table F-1 are affected when various of the assumptions upon which the costs in Table F-1 were based are modified.

Except as noted, the assumptions relating to the various catalogs are the same as for the catalogs costed in Table F-1; the variations are not cumulative. The assumptions regarding each variation are changed only so far as indicated in the left hand column for the individual variations. An explanation of the nature of each of these variations is given in the following discussions of book catalog design and organization.

Table F-2

COST MODIFICATIONS FOR CITY-WIDE
BOOK CATALOG VARIATIONS
(All Costs in Thousands of Dollars)

		Cost Per Page $	% Change
1.	Original catalog	206	0
2.	Fifteen year constant volume	251	+ 22
3.	Twenty year constant volume	288	+ 40
4.	Fifty per page full, 100 per page condensed	123	- 40
5.	One full main entry and 4 condensed added entries	247	+ 20
6.	Variation 4 and variation 5	150	- 27
7.	All full entries	330	+ 60
8.	Supplement every 2 months	148	- 28
9.	Variation 3 and variation 8	206	0
10.	Commercial method (see page 6)	164	- 20

BOOK CATALOG DESIGN AND ORGANIZATION

There are four important factors which can be controlled by the catalog designer. These are:

1. The interval between catalog supplements;
2. The format of the supplement (it is possible to use a book catalog with either a book or a card supplement);

3. The density at which entries are printed on the catalog page; and,
4. Maximum size of the main catalog.

If a book form supplement is used, then once the interval between supplements and the size of the main catalog are determined, the interval between main catalog issuance to produce a minimum cost is mathematically determined. These calculations are demonstrated in Part II of this appendix. If a card form supplement is used, the interval between main catalogs is another factor which can be controlled by the designer. The longer the interval, the lower the cost.

The factors above determine the cost of a single catalog; equally important in a city-wide network is the number of catalogs that must be produced and the number of new titles that will appear in these catalogs each year. These are in turn determined by a fifth factor, namely, the way in which the libraries are grouped together in union catalogs. Each of these five factors is discussed below.

Interval Between Catalog Supplements

The shorter the interval between catalog supplements the greater the cost and the greater the problem in meeting production deadlines. On the other hand a long interval results in poor service because of the great time lag between cataloging of a book and availability of catalog information to the public. The interval that should be taken is the longest one that is consistent with good public service. One month seems to be the longest such interval tolerable for regular public library use.

If we assume a two week time period for production and distribution of the catalog, then in order to have a catalog by June 1, a cut-off date for new data must be established some time in the middle of May and catalog printing started. Thus when the monthly catalog supplement is first received it is a maximum of six weeks old, a minimum of two weeks old, and an average of four weeks.

Form of the Supplement

It is possible to consider a catalog scheme in which there is a main catalog in book form and the supplement is in card form. At each recompilation of the main catalog, the cards produced between cumulations would be discarded and a new card supplement started. This approach is considerably cheaper than the use of a book form supplement.

Furthermore, a part of the advantage of the book form supplement is retained. Although there is a card filing task on this approach, it is less time consuming than card filing using a card catalog only, since the size of the catalog never exceeds the acquisition volume of one main catalog cycle. Because of the smaller card catalog, the look-up time in this catalog is also shorter. In a small branch under such an arrangement the card catalog might never be larger than two or three drawers.

Page Density of Entries in the Book Catalog

With any large listing which is frequently reprinted, the number of entries that can be printed per page is a crucial factor in determining the cost of the listing. People who prepare such listings for various commercial purposes have long known this and put forth a great deal of effort in analyzing typography, page format and entry format in order to achieve maximum density, while maintaining a reasonable level of readability. Abbreviations and other expedients are used to achieve high density. The telephone book is one example of this type of listing. The importance of this consideration is now becoming apparent in the preparation of library book form catalogs. A great deal of additional work has yet to be done in this area.

The factors affecting the page density of entries are the following:

1. The amount of information in an entry;
2. The type styles used;
3. The entry format;
4. The page format; and,
5. The type size, which depends both upon the original type size and the amount of photo-reduction.

One method of reducing costs by controlling the amount of information in an entry is to vary the amount of information with the type of entry. Further compression can be achieved by successively re-reducing the amount of information in the older entries as the years go by, but always providing, in some way, access to the original full entry.

The proper use of typography in printed book catalogs has not been well enough explored. Book catalogs in current use do not make effective enough use of type style. This is partly because of limitations of type styles available, and partly because not enough experimentation has been done on this subject. By proper use of bold face and other contrasting type styles, it should be possible to pack entries very closely, eliminate white space, and still retain good readability. Part of this problem is now being overcome with the availability of new computer-actuated printing devices which can print in a variety of type styles.

After a study of computer-produced book catalogs in current use, it appears that a page density of 30 per page for full entries and 60 per page for added entries is definitely achievable. With attention to the factors enumerated above, a density of 50 per page for full entries and 100 per page for added entries should be achievable.

One company produces a type of computer-printed book catalog in which the author, title and subject entries are all condensed. Full information is shown in a register to which entries are added in order of acquisition. A logical look-up in the register cannot be done directly. However, every condensed catalog entry has a cross reference to the register, so that the full information can always be obtained with a second look-up. This is one of the least expensive methods of producing a catalog, since the register entries are printed only once. They are not reprinted or recumulated. As new pages of register entries are prepared, they are added to the end of the volume containing the register entries. As compared to a catalog showing full entries everywhere, this is extremely inexpensive. As compared to the catalog proposed here it is about $42,000 less expensive. It is felt, however, that the added convenience of having the full information at least at the main entry portion of the catalog is a warranted additional cost.

Size of the Main Catalog

Unlimited cumulation and reprinting of the main catalog cannot be tolerated. Some method of setting a limit to the size which this catalog will reach must be adopted. This is a change from the traditional notion of the ever-expanding catalog. One method would be to proceed with successive ten year cumulations. This would mean that older material would require one or more additional look-ups. However, the majority of the material in active use would be represented by the current main catalog.

An even less expensive method would be to retire a catalog after ten years, and start over again with fresh materials in the new ten year catalog, retaining none of the material in the older catalog. This would make the new catalog of much less use during the first few years, since it would show only a few years' holdings and there would be constant reference to the previous catalog. Thus it would seem wiser to show the previous ten years' holdings in the current catalog, and in each new cumulation drop approximately as many entries as are added, keeping the size of the catalog roughly constant. The dropped entries would not be lost, however. They would be available for look-up in the cumulations just previous to the new cumulation. As an additional feature, it would be possible to recumulate the second ten year catalog together with the first ten year catalog at the end of 20 years, to produce a 20 year catalog. This cost spread over the 20 year period would not be unreasonable.

By subjecting the older entries in the catalog to greater compression it is possible to produce a catalog showing 20 years of holdings, without as much of an increase in cost as is shown in the catalog cost figures for a 20 year catalog using 30 entries per page for main entries and 60 for condensed. On this scheme, the catalog for the first ten years would be cumulated as described in the proposal here. In the second ten years, each time new entries were added in a recompilation of the main catalog, the old entries would not be dropped but would be reduced to one line in length and would carry with them a reference to the full entry in the previous ten year catalog. At the end of 20 years, this second catalog would contain 20 years of entries with the oldest ten years highly compressed. It would then be economical to produce a 20 year catalog with all entries shown in their original length and start on a new cumulation which would retain 20 years of entries, with the oldest ten years in single line form. At each compilation another group of entries would be reduced to single line form and the oldest group of single line entries would be dropped. The group dropped off would, of course, still be represented in the first 20 year catalog.

Methods of Grouping Libraries in a Union Catalog

There are two bases upon which libraries are generally grouped together for the preparation of union catalogs. The first is a grouping based upon similarity of collections. The second is a grouping based upon the existence of strong interlibrary loan arrangements among the members of the group. This second method depends upon organizational arrangements and these in turn are usually on a geographic basis.

The first method should be generally more economical. This is because there should be a greater overlap of titles among the group of libraries of similar type. The greater the overlap of titles, the fewer the number of pages required for the catalog and the lower the cost. For instance, suppose that there were no overlap among the group of libraries represented in the union catalog; then the number of pages required to print the catalog would be the sum of the number of pages required to print separate library catalogs and there would be no savings as compared to the printing of separate library catalogs. With the first method it is also more likely that each of the libraries represented in the catalog will actually hold a large fraction of the items in the catalog. Thus it is less cumbersome to use the union catalog as a catalog of the library's own collection.

The second method is of greater value if the principal use of the union book catalog is to facilitate interlibrary loan.

Part II

BOOK CATALOG COST CALCULATIONS

OPTIMUM RECUMULATION INTERVALS

The longer the interval between recumulation of the main catalog, the fewer main catalog printings there are, and the more supplement printings. The minimum cost for the catalog results if there is the right balance between the cost of printing the main catalog and the cost of printing the supplements. The larger the size of the main catalog, the greater should be the interval between recumulations. Thus, with a constant volume main catalog, a constant interval between recumulations can be taken. However, with an expanding catalog, the interval should increase as the catalog grows.

For a constant volume catalog the optimum interval is given by the following formula:

$$\sqrt{2\ (\text{catalog size})\ (\text{supplement period})}$$

This should be adjusted to the nearest whole multiple of a supplement period. "Catalog size" and "supplement period" should both be in the same units, e.g., months or years. "Catalog size" is the number of years or months of cataloging contained in each printing of the constant volume main catalog (i.e., ten years, 15 years, etc.). "Supplement period" is the time interval between printing of supplements.

For an expanding catalog, starting with no entries, minimum cost is obtained by printing the first main catalog at the end of the third supplement period, and thereafter increasing the interval between the main catalog printings by one supplement period. Thus, if the supplement period is one month, main catalogs would be printed in the following months: 3, 6, 10, 15, 21, 28, etc. This results in a slowly increasing interval between main catalogs. Variation in the interval between main catalogs is too large, however, so it is better to skip the first few printings in this series and start at a later point.

Both the formula for the constant volume catalog and the rule for the expanding catalog assume the average cataloging rate per supplement period to be roughly constant.

EXPLANATION OF PRINTING COST TABLES FOR CONSTANT VOLUME CATALOGS

Item Multiplication Factor

Each item entered into the catalog will be printed in each supplement until the next main catalog is printed, and then will continue to be reprinted in the main catalogs for a number of years. The item multiplication factor shows the number of times, on the average, that an item entered into the system will be printed in supplements and main catalogs.

This factor is calculated assuming main catalog printings at the optimum interval. The optimum interval is shown in Table F-3a for reference.

The values for the item multiplication factor in the table are calculated as follows:

$$\frac{1}{2}\left(1 + \frac{\text{optimum interval}}{\text{supplement period}}\right) + \frac{\text{catalog size}}{\text{optimum interval}}$$

Item Density

Item density relates to the amount of catalog space that a single item will require. This depends upon the number of entries printed for each item, whether they are full or condensed, and the density per page with which entries are printed. The item density is equivalent to the number of items per page that are obtained for a given specification of entry density per page and entries per item. To look at it another way, an item density of 12 means that one item will generate entries that occupy a total of one-twelfth of a page of catalog space.

Cost Per Page

These are average commercial printing costs arrived at by inspecting data from a variety of sources. These costs include photography, platemaking, printing, collating, and binding. It is assumed that the computer-printed page is completely formatted and requires only photo-reduction.

Pages Per Year

Using the data from Tables F-3a and F-3b, the average number of pages per year (main catalogs and supplements) that will have to be printed for each item cataloged is shown in Table F-3d. This figure is simply F divided by D.

Yearly Catalog Cost

For the specific catalog proposed in the body of this report, Tables F-3c and F-3d are applied to calculate yearly cost for various cataloging rates and numbers of copies of the catalogs desired. The results of these calculations are shown on Table F-4.

Tables F-3

BASIC PRINTING COST TABLES— CONSTANT VOLUME CATALOGS

Table F-3a

Item Multiplication Factor (F)

Supplement Period	Catalog Size	10 Year	13 Year	15 Year	20 Year
Monthly	Opt. Int.	15 Mo.	18 Mo.	19 Mo.	22 Mo.
	Item Factor	16	18.2	19.5	22.5
2 Month	Opt. Int.	22 Mo.	26 Mo.	28 Mo.	32 Mo.
	Item Factor	11.5	13	14	16
3 Month	Opt. Int.	27 Mo.	30 Mo.	33 Mo.	39 Mo.
	Item Factor	9.5	11	11.5	13

Table F-3b

Item Density (D)

Entries Per Item		Entry Density Per Page	
Con-densed	Full	60 30	100 50
3	1	12	20
4	1	10	16.5
2	2	10	16.5
3	2	8.6	14.2
0	4	7.5	12.5
0	5	6	10
4	0	15	25
5	0	12	20

Table F-3c

Cost Per Page
(in dollars)

Copies	100	200	300	400	500	600	700	800	900	1,000	1,500
Cost	2.00	2.30	2.75	2.95	3.15	3.40	3.60	3.80	4.05	4.25	5.35

Table F-3d

PAGES PER YEAR FOR EACH ITEM ADDED (F/D)

F D	9.5	11	11.5	13	14	16	18.2	19.5	22.5
6	1.6	1.8	1.9	2.15	2.3	2.7	3.0	3.25	3.7
7.5	1.25	1.45	1.55	1.75	1.85	2.1	2.4	2.6	3.0
8.6	1.1	1.3	1.35	1.5	1.65	1.8	2.1	2.3	2.6
10	.95	1.1	1.15	1.3	1.4	1.6	1.8	1.95	2.25
12	.79	.915	.955	1.1	1.15	1.35	1.5	1.6	1.9
12.5	.76	.88	.92	1.05	1.1	1.3	1.45	1.55	1.8
14.2	.67	.775	.81	.915	.985	1.1	1.3	1.4	1.6
15	.63	.73	.765	.865	.935	1.05	1.2	1.3	1.5
16.5	.575	.665	.695	.785	.85	.97	1.1	1.2	1.35
20	.475	.55	.575	.65	.70	.80	.91	.975	1.1
25	.38	.44	.46	.52	.56	.64	.73	.78	.9

Cost Formula

Catalog cost = (I) (F/D) (cost per page)

where I = items added per year
F = item multiplication factor
D = item density

Table F-4

YEARLY CATALOG COST IN THOUSANDS OF DOLLARS

(Assumptions: 10-year catalog, monthly supplements, 1 full entry and 3 condensed entries per item, 30 full entries per page, 60 condensed entries per page)

Yearly Titles Added \ Copies	100	200	300	400	500	600	700	800	900	1,000	1,500
1,000	2.7	3.1	3.7	4.0	4.25	4.6	4.85	5.15	5.45	5.75	7.2
2,000	5.4	6.2	7.4	8.0	8.5	9.2	9.70	10.3	10.9	11.5	14.4
3,000	8.1	9.3	11.1	12	12.7	13.8	14.5	15.4	16.3	17.2	21.6
4,000	10.8	12.4	14.8	16	17.0	18.4	19.4	20.6	21.8	23.0	28.8
5,000	13.5	15.5	18.5	20	21.2	23.0	24.2	25.7	27.2	28.7	36.0
10,000	27.0	31.0	37.0	40	42.5	46.0	48.5	51.5	54.5	57.5	72.0
15,000	40.5	46.5	55.5	60	63.7	69.0	72.7	77.2	81.7	86.2	108
20,000	54.0	62.0	74.0	80	85.0	92.0	97.0	103	109	115	144
25,000	67.5	77.5	92.5	100	106	115	121	129	136	144	180
30,000	81.0	93.0	111	120	127	138	145	154	163	172	216
35,000	94.5	108	129	140	149	161	170	180	191	201	252
40,000	108	124	148	160	170	184	194	206	218	230	288
45,000	121	139	166	180	191	207	218	232	245	259	324
50,000	135	155	185	200	212	230	242	257	272	287	360
55,000	148	170	203	220	234	253	267	283	300	316	396
60,000	162	186	222	240	255	276	291	309	327	345	432